

# The Mining Journal

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Railway & Commercial Gazette

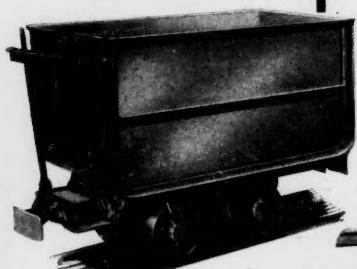
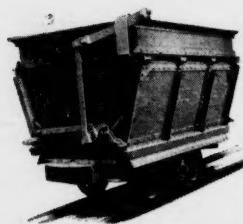
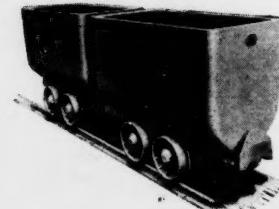
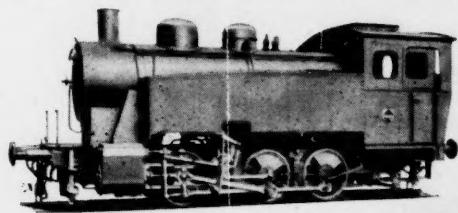
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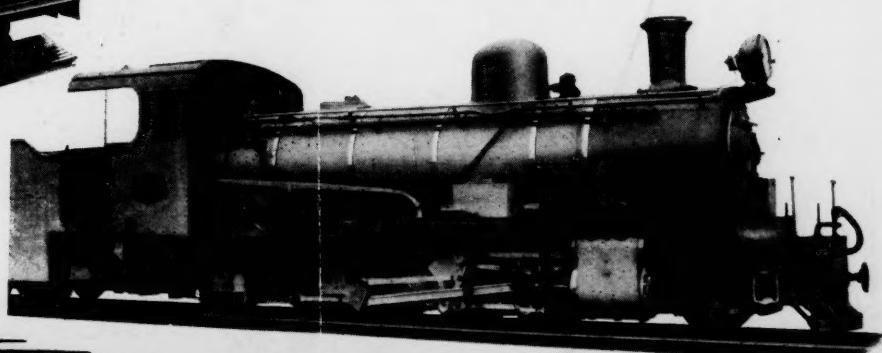
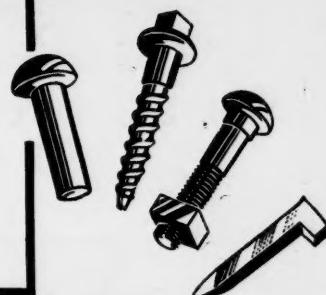
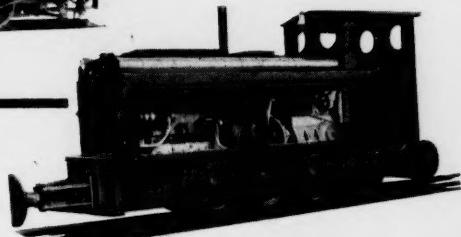
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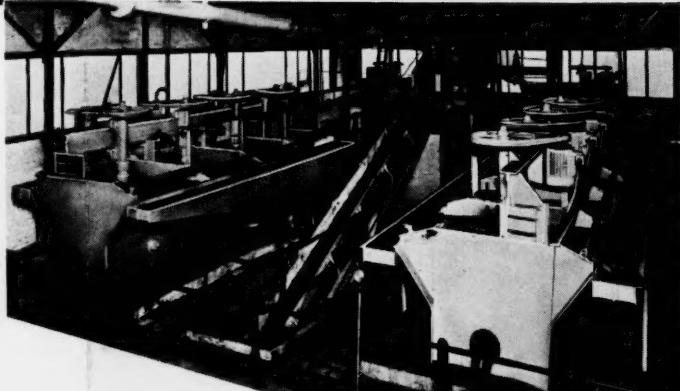
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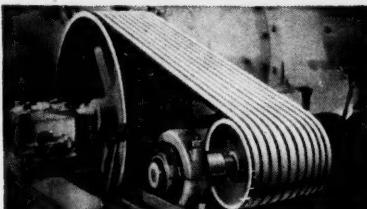
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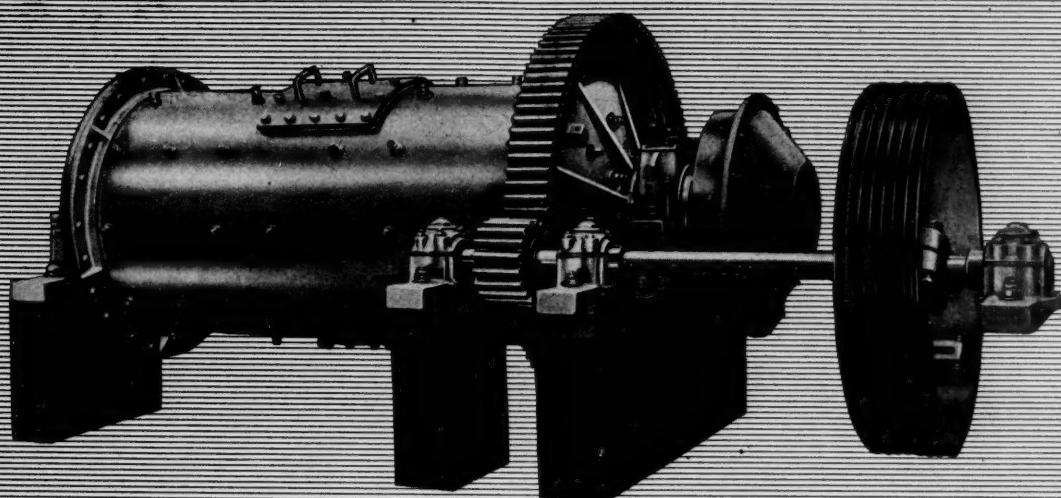


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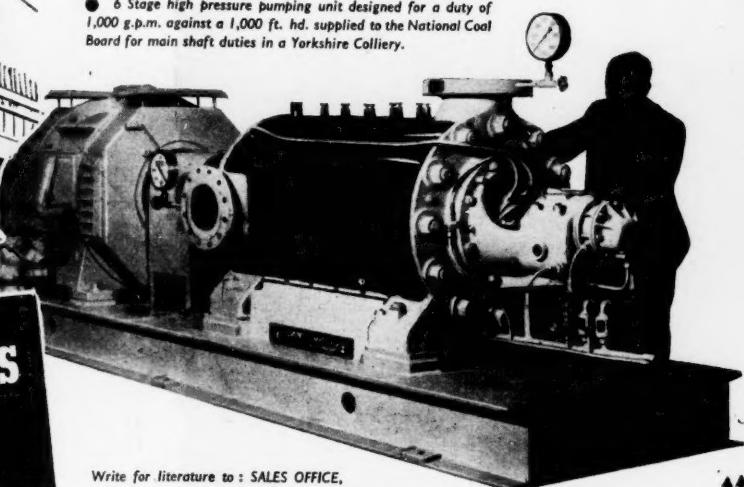


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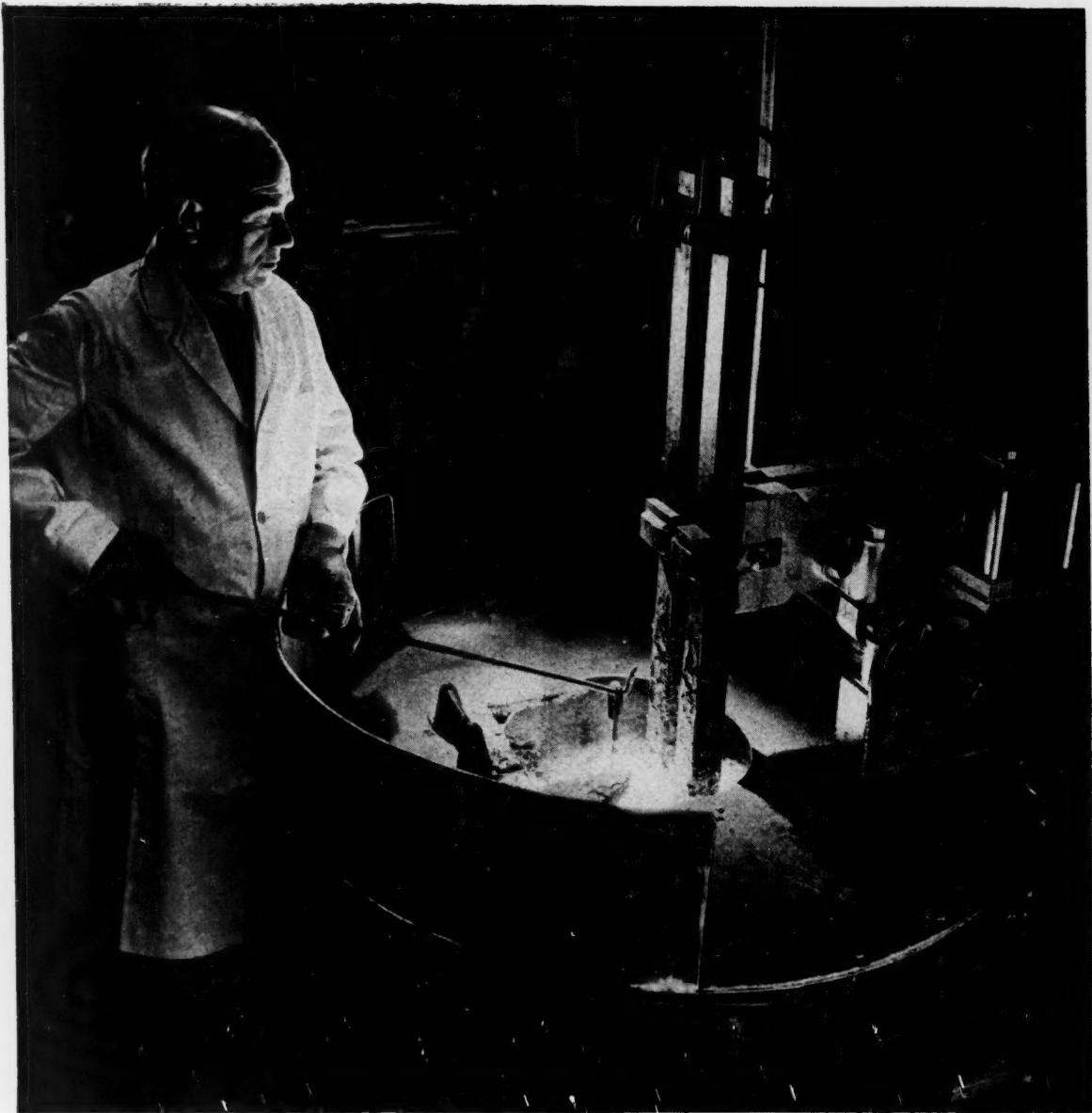
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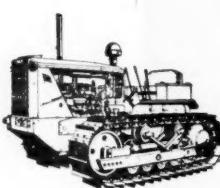
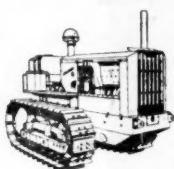
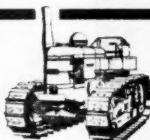
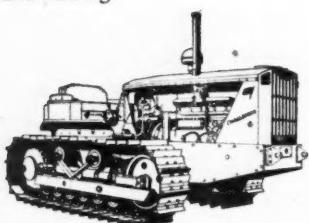
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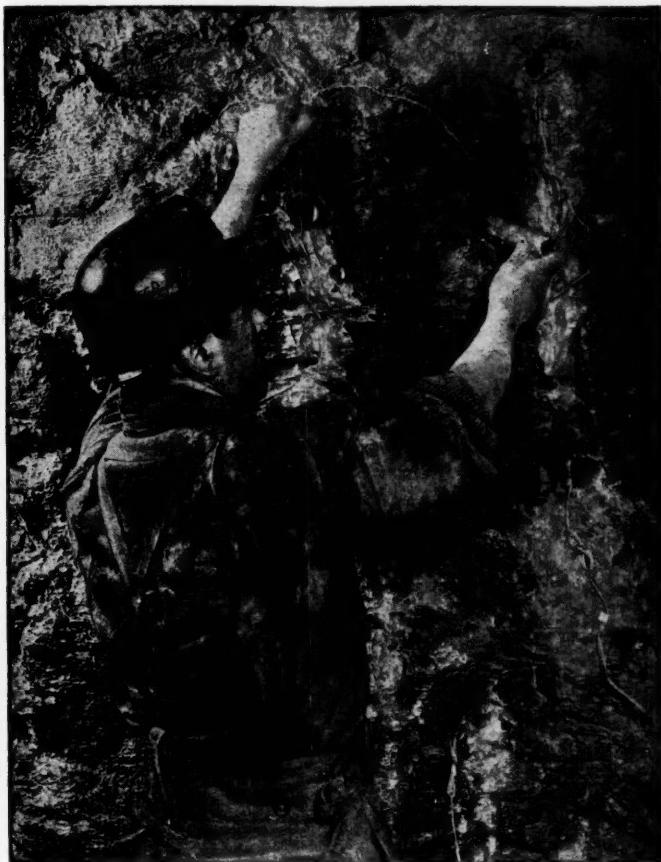
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# The Mining Journal

Established 1835

Vol. CCXL No. 6144

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## NOTES AND COMMENTS

### The Future of our Coal Supply

The report and accounts of the National Coal Board for 1952, issued towards the end of last week, will do little to reassure the nation as to the future of our coal industry, which is the backbone of our vital problem of increasing industrial production on a basis competitive with other countries. The report, of course, contains a large amount of technical detail with which our Coal Correspondent deals elsewhere in this issue, but on the broad issue of our prospects for future supply it is the reverse of reassuring.

An atmosphere of fatalism with regard to coal is perhaps not surprising in the case of the directors of a nationalized industry, but unfortunately it extends to a wide section of the general public though there have been signs lately of anxiety being displayed by a considerable section of the Conservative Party in the House of Commons.

The total output for the year was 226,400,000 tons, and the estimate of probable annual demand for coal for home and export between 1961 and 1965 was put in the annual report of 1950 at 230-250,000,000 tons. The Ridley Committee estimated for a demand in excess of 260,000,000 tons in ten years time. It would be interesting if the National Coal Board had addressed itself to the question of how this further requirement is likely to be met. "More coal is needed," according to the report, "than can be got from deep mines at present or in the immediate future," and the Board considers it will be necessary to produce as much open-cast coal as possible for a number of years to come. It points out that there is an urgent need for more prospecting to map out coal seams which could be worked economically. During the winter before last the Board found it necessary to import 230,000 tons from the United States and 104,000 tons from India, entailing a loss of £1,750,000 or 103s. per ton, and for the year 1951/52 there was a deficit of £8,200,000 on the Board's operations.

Although the number of men on the books of the Board increased by 22,500 during last year the increase in output was only 3,500,000 tons and much of the increase was absorbed in necessary development for future output. Even so, the unrelenting pressure for current production curtailed the scale of such development. Actual expenditure on

capital account was only 64 per cent of the plans drawn up in 1949. In 1951 the percentage was 57 per cent, and in 1950 76 per cent, so the failure to attain the estimated expenditure is no new feature. We should like to be told more of the progress made in prospecting in depth. One thousand and eight-five boreholes were put down but only 38 went deeper than 1,500 ft. When we consider the very shallow depth to which coal working in this country has progressed as compared with depths operated in other branches of mining abroad, a much more energetic boring programme seems necessary.

Delays in bringing major reconstruction schemes into production are stated to have had the effect of reducing productivity and increasingly more reliance has to be put for future production on the big schemes. Most of these are said to have fallen behind schedule and in some cases seriously so, with the result that many pits with extremely low productivity, which should have been closed, have had to be kept in production. "The need to regain lost ground is a challenge to the industry"—or should we say to the National Coal Board? The function of the coal survey is said to be to determine the quality of the seams being worked and likely to be worked in the future.

During the year under review we are told a fresh survey of seams of coal in North Staffordshire was completed, and good progress made with a survey of Leicestershire coal; a survey of Kent coals was begun, but we are not told anything of what these exploratory operations can mean in terms of probable fresh coal reserves. Boring, we are told, is an expensive process, but this surely is not a fresh discovery, and in view of the critical outlook in future years this rather negative attitude is disquieting. Already in the steel industry conversion to oil firing is being considered. Any further advance in coal prices will greatly widen the competition of oil with coal in industry and we can hardly suppose that the National Coal Board, at any rate, is expecting to find eventual salvation by supplementing coal output by imports of oil or even, more remotely, looking to atomic energy as an alternative. Nor, in appraising the future, can we ignore the present mood of the National Union of Mineworkers and their demands for further increases in pay.

### The Geological Mapping Programme

Of basic importance to mining and industrial development in Britain is the work of the Geological Survey, to which reference was made here last week. The Survey is constantly called upon to supply geological information on such subjects as the availability of minerals, water supply and the geological formation of sites.

The present-day demands for geological information require that geological maps for most areas in Britain should be compiled on a scale of 6 in. to the mile. When the D.S.I.R. post-war plans were prepared, it was estimated that there were some 33,000 square miles of Britain which had not been surveyed on this scale. The plan of expansion for the Geological Survey then approved provided for the completion of the mapping programme in about 30 years.

Such has been the demand for the Survey's help on current problems, however, that according to the Annual Report of the D.S.I.R. for 1951-52, it will take more than a hundred years to complete this programme at the present rate of progress! Until this rate can be improved there will be increasing difficulty and delay in answering many enquiries, and besides hindering industrial projects such difficulties will aggravate the pressure on the existing staff, thus further delaying the mapping programme. The remedy, of course, lies in the appointment of more field staff. The need for additional staff was foreseen after the war and a limited increase in the number of geologists has actually taken place. The tempo of expansion has been drastically curtailed, however, in accordance with the general curtailment of Government spending which followed the economic crisis of 1951.

The need for economies is not disputed, but geological information is of such critical importance to economic recovery that this particular economy is liable to prove extremely costly from a long-term point of view. Apart from the possibility of conserving dollars by the location of exploitable minerals, the Survey's operations are helping to provide British industry with essential raw materials such as dolomite for steel production. Exploratory work has been enormously increased by the expansion projects of the National Coal Board, which involve extensive boring programmes in various coalfields throughout the country. Additional staff had to be allocated to the Water Department as a result of the demands imposed by the Water Act (1945) and supplementary legislation. There is a variety of other field work to be carried out.

Apart from the Atomic Energy Division, the Survey confines its operations to the United Kingdom and the highest possible priorities are accorded to coalfields exploration, minerals development, and water resources. It is obvious, however, that the amount of work that can be performed is limited by the resources available. Until the mapping programme has been completed, mining and industry will continue to be handicapped by inadequate information. In the circumstances, there appears to be an unanswerable case for providing the Geological Survey with a staff and income commensurate with its responsibilities.

### American Activity in Seaway Project

An optimistic note was sounded recently in the negotiations on the St. Lawrence Seaway project after conversations at a high level between Canada and the United States. The source of the optimism was a report from Washington stating that President Eisenhower and his Cabinet had unanimously agreed that "United States participation in the project is highly desirable." The co-operation forthcoming from the southern nation, however, must be regarded as being on a limited scale, as it was agreed at the same time that American participation was considered as desirable only if it was limited to the Inter-

national Rapids section of the St. Lawrence River.

The Prime Minister of Canada, Mr. St. Laurent, is reported to have discussed the development with the President during the two days prior to the announcement, and the deliberations were concluded after the Cabinet and President Eisenhower had studied a report submitted by a special Cabinet Committee appointed by the President to examine the project, already the subject of lengthy discussions between the two countries.

A comprehensive article on the Seaway project appeared in our issue of May 8, 1953, in which the author hinted at Canadian impatience at the continual delays.

## Brazil

(From Our Own Correspondent)

Teresopolis, May 12.

Increased co-operation in the development of Brazil's strategic reserves is expected to result from the visit to Washington of Admiral Alvaro Alberto, President of the National Research Council. Intensive prospecting and increased exportation of beryllium and zirconium are among the questions to be debated with the officials in charge of American stocks of strategic materials. The assistance to be given by United States experts with the project for construction of a 450,000,000 volt sincrocyclotron in Brazil will also presumably be discussed.

President Vargas has approved the Research Council's recommendation that consignments of caldasite for exportation be submitted to prior chemical analysis and only licensed for shipment when the  $U_3O_8$  content is below 0.2 per cent. Further, that exports to June 30 next may not exceed the total sent abroad in 1952 and that future quotas must be established by decree.

Caldasite, which was discovered on the Pocos de Caldas plateau by Orville Derby, the founder of the Brazilian Geological Service, a few years prior to his tragic death in 1915, is similar to baddeleyite, but instead of having the form of rounded pebbles the ores are flat and smooth. They range in colour from light brownish-grey to blue and are a mixture of zirconium silicate and zirconium oxide, with a variable percentage of  $ZrO_2$ , usually between 65 and 80, and small quantities of uranium oxide. Caldasite has attracted little attention until recently, when its radioactive properties were sharply revealed in the course of aerial prospecting over Pocos de Caldas.

A recent Presidential Order fixes at 4,000 tons the annual export quota of beryllium in the form of primary concentrate, or the equivalent quantity of metallic beryllium in the case of industrialized products. The minimum price and other conditions, as established in 1952 (see *The Mining Journal*, September 12, 1952), are maintained this year. Priority will be given to exports of industrialized products.

The Institute of Industrial Technology confirms the recent discoveries of uranium, thorium and columbium in the Araxa region of Minas Geraes, near the Sao Paulo border. Analysis shows medium-grade uranium and thorium and high-grade columbium in this region. The Institute reports that open-face mining is possible.

The National Research Council, in order to check the dissemination of over-enthusiastic reports, has issued the following statement: "The President of the Council has announced emphatically that nuclear fuels are not yet produced in Brazil. The nitrate of uranium, separated from national ores in the Technological Research Laboratories at Sao Paulo, represents merely an indispensable step towards local industrial production of uranium salts or metallic uranium of a sufficient degree of purity to be utilized as nuclear fuel in future reactors."

# Western United States

(From Our Own Correspondent)

Portland, Oregon, April 23.

Should the present Russian "peace offensive" bring the hoped-for result it is to be expected that there will be a slackening of demand for all metals but the general feeling is that there should be no "truce of the bear" until many things are settled besides the hostilities in Korea. If this policy is followed there should be time to build up a demand for peace-time goods before too drastic a decrease in war-time production.

On April 20, Secretary of the Treasury Humphrey, a mining executive before his appointment, in his first major speech since assuming office stated that if peace is accomplished we may expect "adjustments but not a depression" and visualized "a stronger economy based on sounder fundamental conditions," one of the first of which, he emphasized, must be a sound currency.

## APPARENT STABILIZATION IN COPPER

Apparently some stabilization, temporary at least, has been reached in the copper market. Kennecott, Phelps-Dodge and Anaconda, which produce about 75 per cent of the country's output, had been quoting individually from 27½ to 32 c. but by April 1 all three had adjusted to 30 c. although small producers and custom smelters sold as high as 32 to 34½ c. Meanwhile there is the prospect that substantial amounts will reach the United States from Africa although with demand continuing high it is not expected that this foreign metal will have a serious effect on the market. Indications are that the supply situation is easing and further adjustments will come gradually with a possible but minor decrease in price. A further consideration is the likelihood of a considerable increase in the flow of scrap which is becoming manifest.

In Arizona Magma Copper Co. has developed in its Far East area 260,000 tons of ore assaying 7.8 per cent copper with minor gold and silver and has shipped to its mill 30,000 tons averaging 4.96 per cent. The original discovery of this ore body was noted in *The Mining Journal* of August 11, 1950, as occurring in an entirely different formation and different locality than that which has sustained the mine over its many years of production.

## A PRIORITY CONSIDERATION

The mining industry's chief concern on the national scene is the continued depression in the lead and zinc market since the break in prices last May without any substantial upturn. Two suggestions have been made in Congress for relieving the situation but neither has been embodied in a bill as yet. One of these advocates a metals credit corporation which would function along the lines of the comparable corporation in agriculture. The mining industry is inclined to look askance at such a solution. The other is a sliding scale tariff tied to a base price to be established for each metal. Present tariffs would be retained and as the price of a metal increased or decreased a full cent from the base an offsetting change would be made in the tariff. It is merely an extension of the principle invoked in 1952 when the tariffs on lead and zinc were suspended and then restored when prices fell below a pre-determined figure. Whichever plan is introduced in Congress it is expected to meet with vigorous opposition and it is quite likely that by the time action is taken the situation will have righted itself.

Consumption of lead and zinc has held up quite well but production is declining and some of the zinc smelters seem to be holding the metal until there is an improvement in the market.

A leading casualty of the bad market situation was the Shenandoah-Dives with its 700 ton mill in the San Juan district in Colorado which closed down March 15, idling 150 men. The shutdown has a depressing effect on the district as the mill has treated custom ores for a number of small producers thereabouts. In the Coeur d'Alene district in Idaho the Bunker Hill and Sullivan is sinking the vertical three compartment Crescent shaft from the 1,200 to the 3,200 level from which it will carry on extensive exploration by diamond drilling and crosscutting to determine the downward extension of ore bodies that were productive above the 1,200 level.

## OTHER SHUTDOWNS

The Hercules at Burke, one of the early bonanza mines of the district, is deepening its shaft from the 1,200 to the 1,600 level for an exploration campaign similar to that of Bunker Hill and Sullivan. In New Mexico American Smelting and Refining Co. has closed its Ground Hog, one of the leading lead-zinc producers of the state employing 700 men. This leaves U.S. Smelting's Bayard as the only large-scale zinc/lead operation in New Mexico.

Going back to the Coeur d'Alene, Bunker Hill and Sullivan has discontinued its block caving operation and the reworking of its jig tailings, affecting 150 men and reducing its mill operations from 3,000 to 1,200 tons daily while Day Mines has shut down some of the marginal stopes in its Tamarack mine.

Bear Creek Mining Co., subsidiary of Kennecott Copper Corporation, has optioned a group of 18 tungsten claims in the Jungo district in Humboldt County, Nevada. Surface and underground exploration and metallurgical tests indicate the possibility of large-scale operation and an extensive drilling campaign will be inaugurated. The group is in the general vicinity of the Nevada-Massachusetts and Getchell, two of the large tungsten producers of the country, and lies between the two.

## DOMESTIC OUTPUT OF CHROME

El Dorado County, California, which was an active chrome producer during World War II is experiencing an awakening, prompted in part by the fact that the Government has established purchasing facilities for chrome ore at Grants Pass, Oregon, within reasonable shipping distance. El Dorado Chrome and Pilliken mines are being reactivated and their mills put in operating condition. It is from a number of such small and medium sized mines that the United States derives its domestic output of chrome but there is expectation that this will be materially increased from large deposits of low grade presently being developed in Montana.

Mineral Materials Co. which has been operating a high grade iron ore deposit near Lovelock, Nevada, and shipping the ore to Japan, is transferring part of its equipment and crew to a newly acquired deposit near Baker in San Bernardino County, California. This is only one of a number of small deposits of high grade iron ore which has been known to exist for some time but considered too small for exploitation. Another such, of an estimated content of 1,000,000 tons, in Nevada County, California, has been leased by Bethlehem Steel Corporation.

Yuba Consolidated Goldfields has launched a new bucket line dredge in the Hammonton field in California which makes three that Yuba has in operation in this field at present. The new boat has a displacement of 3,600 tons, is equipped with 18 cu. ft. buckets and has a digging depth of 100 ft. below the water line. Unless conditions improve in the gold mining industry it is probable that this is the last dredge that will be put in operation in California.

Sunshine Mining Co. in the Coeur d'Alene district is reactivating its antimony plant which was closed down in January, 1944, because of excess of lead in the ore.

# Birth of South Africa's Uranium Industry

By A. G. THOMSON

**At the time of writing, twenty-one mines on the Witwatersrand and in the Orange Free State have been authorized to produce uranium, and it was recently announced by the South African Minister of Mines, Mr. J. H. Viljoen, that the capital cost of the necessary plants now being installed was approximately £40,000,000 which in full production would provide a uranium output worth approximately £30,000,000 per annum. The following article gives an outline of the development of the South African uranium industry to date, and adds notes on treatment methods as well as aspects of legislation governing uranium production.**

On October 8, 1952, the uranium plant at West Rand Consolidated was opened by the Prime Minister of the Union, Dr. D. F. Malan, and a new chapter in the eventful history of South Africa's mining industry began.

The existence of radioactive minerals in Witwatersrand ores has been known for nearly thirty years. In a paper entitled "Mineral Constituents of Rand Concentrates," delivered to the Chemical, Metallurgical and Mining Society on October 20, 1923, Mr. R. A. Cooper announced that a group of mines from the Boksburg Fault west to the Central Rand carried a mineral known as uraninite, nearly one half of which consisted of a compound of uranium. The paper described uraninite as having the black colour and brilliant lustre of polished jet. Among the constituents mentioned were uranium oxide (49.1 per cent), thorium oxide (1.6 per cent), cerium group oxides (0.2 per cent), yttrium group oxides (1.5 per cent), gold (6.6 per cent), platinum and osmiridium (4.5 per cent), lead (8.1 per cent), 142 milligrams of radium per ton, and a number of other elements and compounds.

Mr. Cooper suggested that it would be interesting to purify the uraninite by mechanical means—probably flotation would separate sulphides, arsenides and metals from the oxide—and ascertain the true constituent of the pure mineral and its radioactive value. Stating that some samples of pitchblende had five times the activity of the radium contained, though the U:Ra ratio was constant, he expressed the opinion that, since the uraninite concentrate contained approximately 140 milligrams of radium per ton, it would require about 200 tons of concentrate to supply the demand, presuming almost complete recovery.

In seconding the vote of thanks for the paper, Professor G. H. Stanley made a remarkable suggestion. "It is quite possible to my mind," he stated, "that there might be commercial possibilities for these concentrates." Not till 22 years after Mr. Cooper's identification of uraninite did the truth of these prophetic words become apparent. Early in 1939 the discovery that the nucleus of uranium was fissionable gave a new significance to the low-grade uranium occurrences of the Rand. In 1945, the dropping of the first atomic bomb precipitated a world-wide quest for uranium which has never ceased.

## LEGISLATION REGARDING URANIUM

The exploitation of uranium in the Union and South-West Africa was brought under the control of the South African Government by War Measure No. 65 of 1945, promulgated under the Emergency Regulations. After the war it became necessary to place the appropriate provisions of the War Measure on a permanent footing, and in 1948 the Atomic Energy Bill was brought before the House of Assembly. Considerable speculation was roused by the Speech from the Throne, in which the Governor-General told Parliament that the discovery of considerable uranium resources in the Union called for State control of the exploitation and disposal of this potentially dangerous and strategic commodity. The size and payability of the South African deposits were not revealed, but the fact that the Prime Minister, General Smuts, was himself to handle a Bill to control the mining and use of uranium was taken

as an indication of the importance attached to the occurrences in question.

Authentic occurrences of pitchblende exist in the Gordonia district of the Cape Province, but they are limited in extent. Uranium ochres are found in many parts of the Union, but it seemed clear from the published reports that none of these could be regarded as more than specimen producers without economic value. Many other South African minerals were known to contain small quantities of uranium, for example, the columbite of Namaqualand, euxenite and samarskite. None of these minerals, however, was likely to be used as a source of uranium or radium, while pitchblende and ochres were available. Informed opinion considered it much more probable that the "considerable resources" mentioned in the Speech from the Throne were the Rand rock reserves. Apart from the possibility that there might be vast tonnages of uranium in the Rand's unmined gold reserves, it was believed that the mine dumps contained large quantities which might conceivably be recovered. This opinion proved to be correct, for it has been stated that in some mines old, discarded slimes will be treated in the uranium plants.

## GROWTH AS A MAJOR PRODUCER

A note of caution was sounded by a distinguished South African scientist, who pointed out early in 1948 that it would be a mistake at that stage to attach too much importance to the Rand's uranium. The Government was looking ahead, he stated, and it might take 100 years before the South African deposits were extracted. He knew of no scientific means in existence to isolate low concentrations of uranium such as those of the Witwatersrand. When the main deposits of highly concentrated uranium had been used up, however, the South African resources would assume a new importance!

In the light of available knowledge this view, no doubt, seemed very sound, but experience has shown over and over again that the tempo of mining expansion in South Africa is always liable to exceed all expectations.

The developments which led to the emergence of South Africa as a major uranium producer have been told in considerable detail by the Transvaal Chamber of Mines in their monthly publication, *The Mining Survey*, Vol. 4, No. 3, March 1953, and also in *Optima*, Vol. 3, No. 1, March, 1953, a quarterly review published by the Anglo American Corporation of South Africa.

Reading these accounts, one can scarcely fail to be struck by the happy combination of circumstances which has made the extraction of uranium in low-grade concentrations an economic undertaking. In the first place, this strategic mineral was found in close proximity to the University and Government laboratories of Johannesburg and Pretoria, where the men and equipment most capable of dealing with fissile materials were located, and where its extraction could be undertaken by an established mining industry, whose technical resources were unsurpassed. Notwithstanding these unique facilities, the speed with which processes have been developed through the pilot plant stage to commercial production represents a great scientific and technological achievement.



The residue containing uranium is sent by endless belt to the uranium extraction plant.

In Dr. B. F. J. Schonland, Dr. S. M. Haughton, Professor L. Taverner, and their colleagues, the Union had a team of scientists who were particularly well qualified to lay the foundations of the uranium industry. It was an American scientist, however, who first set in motion the chain of events which led to uranium production in the Union. Dr. G. W. Bain, Professor of Geology at Amherst College, Massachusetts, visited South Africa in 1941 and, as a matter of routine, took back with him to the United States a number of ore samples he had collected on Witwatersrand gold mines. At a later period he was entrusted with the task of furthering the search for uranium. Recalling the paper by Mr. Cooper, he tested the samples and found that the counter reacted strongly. As a result of his secret report the American and British Governments approached the Union Government in 1945, and the possibility of recovering uranium from Rand ores was examined.

Dr. Bain returned to South Africa in September, 1945, as America's representative in a joint British-American undertaking to investigate more fully the uranium content of the Witwatersrand gold mines. From England came Dr. C. F. Davidson, chief geologist of the Atomic Energy Division of the Geological Survey of Britain, as the representative of the British Ministry of Supply. In co-operation with officials of the South African Geological Survey, these men made underground tours of Witwatersrand mines with Geiger counters and also tested many thousands of pulp samples supplied by the gold producing companies. The occurrence of uranium in Rand ores proved to be far more extensive than had been anticipated and the mineral was also found to be present in borehole samples from developing Free State mines.

#### RECOVERY OF URANIUM OXIDE

Meanwhile research on extraction methods was being undertaken in collaboration with the Transvaal Chamber of Mines by the Government Metallurgical Laboratory under Professor Taverner. Experiments were carried out simultaneously at the Chemical Research Laboratory of the Department of Scientific and Industrial Research, Teddington, Middlesex, and at the Laboratory of the Massachusetts Institute of Technology. A process that was both technically and economically satisfactory was evolved and the mechanical equipment was tested at pilot plants on Blyvooruitzicht and Western Reefs. Another plant was built at the Sub-Nigel and was subsequently used in three other mines.

On most South African mines the concentration of uranium is relatively low. It follows that production can best be undertaken by the recovery of uranium oxide from the residual slimes after the gold and silver content have been removed by normal treatment. By a series of fortunate coincidences uranium and gold occur in the same ores and the preliminary treatments are identical, so that no further

provision for crushing and grinding need be made. Thenceforward there are close similarities between the methods of recovering gold and uranium, but the plants differ in constructional and chemical details. By yet another happy chance, cyanide solution does not dissolve the uranium content of the ore, which is retained in the residue from gold extraction. Normally the filter cake is sent to the slimes dam as waste, but on mines producing uranium it will now become the raw material for a second recovery plant constructed as a completely separate section.

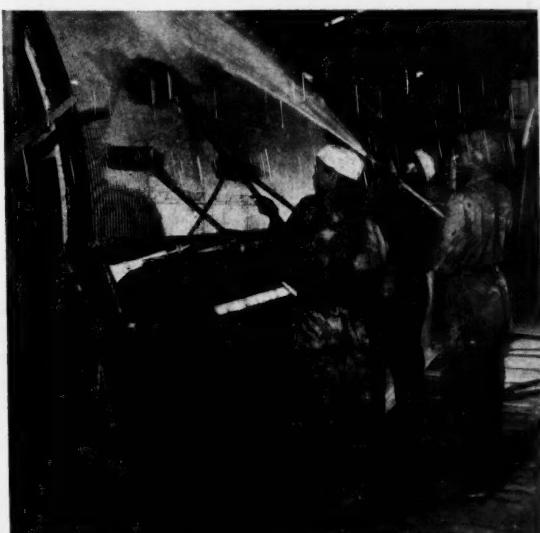
In the uranium plant the filter cake is first mixed with water to reduce it to a form of slime. The slime is then fed to tanks containing dilute sulphuric acid, which dissolves the uranium content. The uranium-bearing solution is filtered off and the solid residue is discharged to the slimes dam as waste. The solution is purified by chemical processes and uranium oxide is precipitated from the pure solution. The precipitate, in the form of a yellow mud, goes to a central calcining plant where it is converted to a dry uranium oxide. This product requires further purification for atomic energy requirements and is therefore refined in Britain and the United States.

It is evident that in mines already producing gold, uranium recovery plants can be incorporated without disturbing the existing flow. Since no additional plant for crushing and grinding is required, the cost of extraction is limited to the treatment of the filter cake from the cyanide process.

#### NEW SOURCE OF PROFIT

According to the last Annual Report of West Rand Consolidated, the total expenditure on the uranium plant up to December 31, 1952, was £1,564,264, which included £43,320 interest on loans received through the Atomic Energy Board. The amount to be received for the uranium produced up to the end of last year could not be exactly calculated, but the estimated net profit of £124,707 represents a very useful addition to the company's revenue from gold. When West Rand Consolidated first announced at the end of 1950 that it would undertake the production of uranium, the profits were estimated at 9d. to 1s. 3d. per share. The quarterly earnings represent a net profit of about 2s. 9d. per share.

Since sulphuric acid plays an essential part in uranium recovery, five plants with an aggregate output exceeding 1,000 tons of acid per day are being provided. One will



Periodical cleaning is necessary for the cloth on the uranium filters which remove solid matter and leave a uranium solution.

be built in the O.F.S. goldfields area. Here again, the industry has been fortunate in having as a starting material Witwatersrand pyrites, which is obtained from the residues of some of the uranium and gold plants.

The development of a uranium industry has presented many other problems. Plant for the production of uranium and sulphuric acid has had to be planned and constructed. Once again circumstances were propitious, for the phenomenal expansion of the metal industries in recent years has enabled the bulk of the highly specialized plant to be manufactured in the country. Since mild steel, cast iron and concrete are all rapidly attacked by dilute sulphuric acid solution, it was necessary either to protect them with an acid resistant covering or to use acid resistant materials. Rubber was used to line mild steel and cast iron and acid proof brickwork was used to protect concrete. Lining various parts of the plant with rubber was probably the biggest task of its kind ever undertaken. The acid resistant materials used were stainless steel, other acid resisting alloys, and plastics.

From the pace at which the programme is being furthered, it is evident that a very high priority is being accorded to the industry by all the Governments concerned. Since the Union's manufacturing potential is heavily taxed by the requirements of rearmament and expansion, it seems inevitable that to some extent concentration on the production of plant for uranium recovery must be hampering the development of the Free State's new gold producers. Having regard to the tremendous importance of nuclear research for both war and peace, any temporary sacrifices necessitated by the expansion of uranium production must be accepted as part of the price of security and future progress.

#### THE URANIUM PRODUCERS

So far 21 mines on the Witwatersrand or in the O.F.S. have been authorized to produce uranium and the list is likely to be further extended. There appears to be no reason why many of the developing mines in the Free State should not be equipped with uranium recovery plants as a matter of routine.

The 21 gold mines that have so far been authorized to produce uranium are, Afrikander Lease, Babrosc Mine (Pty.), Blyvooruitzicht G.M., Daggafontein Mines, East Champ d'Or, Ellaton Gold Mining, Free State Geduld Mines, Harmony G.M., Luipaardsvlei Estate, New Klerksdorp Gold Estates, President Brand, President Steyn, Randfontein Estates, Stilfontein G.M., Virginia O.F.S., Vogelstruisbult Gold Mining Areas, West Driefontein, Western Holdings, West Rand Consolidated, Western Reefs Exploration and Development, and Welkom G.M. Although production on West Driefontein Gold Mining Co. Ltd. has been deferred, other gold mines are being considered as uranium producers, and it is probable that more names will be added to the list of those authorized to produce uranium.

Later news from South Africa indicates that the Stilfontein Gold Mining Company has announced that approval has been received for the extension of the company's uranium plant for treatment under a joint scheme of an additional tonnage of uranium-bearing slimes from four participating mines in the Klerksdorp area. The Stilfontein Company has also been authorized to construct an auto-oxidation plant for the manufacture of sulphuric acid for use in the production of uranium. The cost of the extension and of the acid plant, which will be financed by loans from American and British sources, is estimated at approximately £1,500,000.

It is also expected that the Ellaton Mines, now officially listed among the above producers, will come into production towards the end of the current year at a milling rate of 360,000 tons per annum.

Under the Act of 1948 the uranium becomes the property

of the State immediately it is produced. To cover the present programme a contract has been entered into between the Atomic Energy Board of South Africa and the appropriate agencies of the British and United States Governments. Under this agreement, the Atomic Energy Board sells uranium to the British and United States Governments and passes on the purchase price to the mines. The contracts with the mines are for a period of ten years from the time each mine's plant comes into full production. Prices payable to the mines are related to the costs of production and are so arranged as to provide each mine with a satisfactory margin of profit. Money for the capital expenditure involved in the erection of plants is being advanced from overseas in the form of loans to the mining companies. Thus there is no necessity for shareholders of the companies concerned to be called upon to provide any of the capital required. The price payable for uranium produced is so calculated that at the end of the ten-year period the plants have been paid for out of the proceeds and become the property of the mines concerned.

#### INEQUITABLE TAXATION SYSTEM

In terms of the Union Income Tax law, the profits from the production of uranium are regarded as gold mining profits, and the companies concerned will be required to pay taxation at the rate applicable to gold mining companies on their combined gold mining and uranium profits. Mr. C. S. McLean, president of the Transvaal Chamber of Mines, has described this method of taxing the uranium industry as "inequitable and manifestly in need of reconsideration." In a recent statement he pointed out that the fact that uranium production from residual ores in the O.F.S. would begin before the gold mines reached their full gold production tended to emphasize how inequitable this system was.

An indication that the South African gold mines will produce a considerably greater quantity of uranium than was originally visualized was given recently by the South African Minister of Mines, Mr. J. H. Viljoen. The Minister stated that the capital cost of the plants now being installed was approximately £40,000,000. When in full production the uranium produced would be worth some £30,000,000 annually to South Africa. He added that in 1951 South Africa had been asked to double or treble the contract.

The first returns from West Rand Consolidated suggest that the arrangements are likely to be very satisfactory to the shareholders concerned. The benefits are likely to be far greater than the Government's forecasts suggest. The bonus derived from the recovery of uranium at little extra cost should help to prolong the lives of marginal producers. A development which has very far-reaching implications was the discovery that the Bird Reef series of West Rand Consolidated had a payable combined uranium-gold content which had not hitherto been worked because of the low payability of the gold.

Uranium, in fact, might be described as another windfall to a country which has been very plentifully endowed with mineral wealth. Great credit is clearly due to all concerned for the manner in which the unexpected opportunity has been promptly and ably grasped. The programme has called for a great deal of organization. In December, 1950, the Uranium Technical Sub-Committee of the Gold Producers' Committee was formed to advise on technical details. A month later the Uranium Production Department of the Chamber was formed to work in collaboration with the Sub-Committee.

Co-operation between the South African gold mining industry and the Governments of the Union, Britain and the United States has opened up in a remarkably short space of time a new source of radioactive materials which is likely to have profound consequences on future progress in the use of atomic energy.

## National Coal Board Report, 1952

The following article, received under recent date from our coal correspondent, summarizes the salients of the National Coal Board Report, 1952, and presents a précis of technical progress achieved during the year under review. Output of saleable coal, both deep-mined and open-cast, increased over the production of the previous year, but the general tone of the article is to indicate the difficulties confronting the industry to-day.

The only mitigation of the reverses suffered by the National Coal Board in 1952 was a marked increase in recruitment, which brought the number of mineworkers up from 698,000 in January to 720,500 in December. The most serious setback was a drop in the output per manshift to 98 per cent of that achieved in 1951. This is the first time since nationalization that productivity has failed to rise above that of the preceding year and the coincidence of this decline with the full impact of a passing inflationary period caused a sharp rise of 7s. 7d. per ton in the cost of production. This was not far short of the total increase in production costs during the whole of the previous five years and it swallowed up the additional revenue derived from the higher prices for coal on the home market and from increased exports, and left the Board with a deficit of £8,200,000 at the end of the year. It also brought the accumulated deficit since nationalization up to £14,000,000. The production of deep-mined coal in 1952 was 214,300,000 tons, compared with 211,900,000 tons in 1951, and a further 12,200,000 tons of open-cast coal brought the year's total output of saleable coal up to 226,400,000 tons, compared with 222,900,000 tons in 1951.

The amount spent on capital account in 1952 was £45,500,000, compared with £32,000,000 in 1951, but the lag in the investment programme continued to grow and on December 31 the money spent on new projects and reconstruction was £119,000,000 short of the Plan for Coal estimates.

### MINING TECHNIQUES

The unusually large number of recruits undergoing training during 1951 is given as the main reason for the drop in productivity but the question which naturally occurs to an outsider is why, after so many years of intensive effort, mechanization has not yet reached a stage when it can counteract a slight falling off in skill or effort on the part of the miners. The operation which has so far proved least amenable to mechanization is the loading of coal at the face. Over 200,000,000 tons of coal are still being loaded every year by hand in the coal mines, whilst in most other industries the hand shovel has been superseded by mechanical loaders. It is stated in the Report that underground transport, which takes up 20 per cent of all manshifts, offers more scope for improvement in efficiency than any other mining operation, but we believe that the extension of mechanical loading is basically of greater importance. It is gratifying to note that the Board have now set up an engineering establishment at Isleworth in Middlesex to supplement the efforts of the manufacturers of mining machinery and to develop mechanical inventions.

Some progress was made during the year in mechanical loading, not by new methods, but by extending the use of the Meco-Moore cutter-loader, which has so far proved to be the most suitable machine on long-wall faces. The number of these machines in use increased during the year from 81 to 112 and they produced 6,250,000 tons of the total of 11,100,000 tons of coal loaded mechanically. The difficulty of turning these machines round at the end of the run along the face has hitherto restricted their use to one shift in 24 hours, but some experiments were carried out during the year with a double-ended machine which cuts in both directions and therefore can work on two or more shifts. Further experiments were also made with slow-speed and high-speed coal ploughs and with scraper

boxes attached to wire ropes. In all, 14 installations of this kind were in operation and they produced 326,000 tons of coal between them. It is stated, however, that their scope in this country is limited by the hardness of the coal.

Some seams are rendered amenable to ploughing by water infusion. This confirms the experience gained in South Wales during the inter-war years when the Amalgamated Anthracite Colliery Company discovered that the use of water infusion for the suppression of dust practically eliminated the need for shot-firing.

The Samson Stripper employs an hydraulically operated wedge to dislodge the coal. Seven of them were in use during the year and they produced 458,000 tons of coal but with an average output per manshift of only 5.5 tons. Various types of coalcutters were adapted for loading as well as cutting. All the armoured flexible conveyors which British manufacturers could provide were installed in 1952 and some were imported from Germany, bringing the total at the end of the year up to 64.

### DECLINE OF ROOM AND PILLAR METHOD

All the machines which have been referred to so far are designed for long-wall faces. It will come as a surprise to many to read in the Report that the Room and Pillar method of working is declining rapidly in Great Britain and that the conditions under which it can be mechanized intensively are becoming less common. This leads to the conclusion that American methods of mining are unlikely to be emulated on any large scale in this country. Experiments were carried out during the year with three Joy Continuous Miners, which produced 62,000 tons of coal with an average output per manshift at the face of as much as 30.7 tons. Unfortunately, there seems to be little further scope for these machines in this country.

The old methods of supporting the roof make it difficult to manoeuvre the latest types of machines and much attention is, therefore, being given to the development of prop-free systems designed for continuous mining on long-wall faces (see *The Mining Journal*, January 4, 1952, p. 10). Since safety must be a primary consideration in these experiments, the Board have enlisted the help of H.M. Inspectorate of Mines to carry out the investigations. The use of yielding props is increasing rapidly and the number of these delivered to collieries in 1952 went up from 80,000 to 300,000. The American system of roof-bolting is also being tried out to see if it can be more largely used here.

### UNDERGROUND TRANSPORT

Inefficient rope haulage systems are being gradually replaced by locomotives and belt trunk conveyors, but the natural conditions at many collieries will demand the retention of ropes for main haulage and efforts are therefore being made to improve on existing types. Sufficient experience has now been gained with locomotives to prove their superiority in all cases where suitable roadways can be laid out for them economically and more than 500 of them had been delivered to the pits by the end of the year. Most of them are powered by Diesel engines but the Board have found that battery locomotives have many advantages.

Concern is expressed in the Report about the number of accidents which occur on haulage and conveyor systems and on the fact that the death rate in these accidents was higher in 1952 than in the previous year. Many of the

accidents have taken place on man-riding installations and colliery managers have been instructed to tighten up their standing orders relating to the inspection and maintenance of haulage and conveyor systems. Instructions have also been issued that trunk and gate-road conveyors must be regularly patrolled by experienced men to prevent any repetition of a disaster such as that which occurred at Creswell Colliery in 1950.

#### VENTILATION AND OTHER CONSIDERATIONS

The Report contains the first reference to the possibility that cooling plants may have to be installed at some of the deeper collieries in this country in the future and it is stated that the Board are already carrying out some trials on an air conditioning plant at Snowdon Colliery in Kent. The experiments which were started in 1950 on the drainage of methane and its collection from boreholes and sealed cavities in the goafs are being extended to 16 collieries. All the steam boilers at the Point of Ayr colliery in North Wales have been fired with methane from underground workings since 1950, with an annual saving of 10,000 tons of coal.

It is estimated that currently there are reserves of about 300,000,000 tons of coal within 600 ft. of the surface in Great Britain in seams which are either too thin or too poor to be extracted economically by mining but which might be exploited by underground gasification. This problem is being studied jointly by the National Coal Board and the Ministry of Fuel and Power.

The responsibility for open-cast mining operations was transferred from the Ministry of Fuel to the Board in April, 1952, and from that date the Board have also been

responsible for prospecting for coal near the surface. The responsibility for the requisitioning of land and its restoration still remains with the Government because several Ministerial departments are concerned with matters connected with the use of the land. Most of the actual work of extraction is carried out by contractors and excavations are being carried to a maximum depth of about 200 ft. The cost of production varies greatly but the average cost per ton in 1952 was 49s. 11d., which was 6s. 10d. less than the cost of production of deep-mined coal. Even so, a loss of 2s. 1½d. a ton was incurred on all the open-cast coal produced from April onwards.

The total output of open-cast coal in 1952 was 12,200,000 tons, including 470,000 tons of anthracite in South Wales. Over 100,000,000 tons of coal have already been obtained from open-cast workings and it is made clear in the Report that they will have to be kept open for many years to come. About 25,000 acres, or one part in a thousand of the agricultural land in Great Britain, is being put out of use for food production in this way for an annual return of about 10,000,000 tons of coal.

#### FUEL EFFICIENCY

The Board are pursuing three courses in their endeavour to raise the standard of efficiency in the use of coal: (1) by eliminating inefficient steam plants at collieries, and substituting electric motors for steam engines, (2) by installing more efficient boilers and engines where steam plants must be used, and (3) by collaborating with the British Electricity Authority in establishing central power stations in the coal-fields to burn low-grade coal.

## A Scientific Prospecting Method

The Institute of Geophysics of the University of California has just completed a new electro-magnetic model laboratory and has begun studies which may result in new methods of prospecting and improvements over existing methods.

Under the direction of Dr. Louis B. Slichter, director of the Institute, research is being conducted to increase the efficiency with which current prospecting methods can discover hidden ore bodies. Support for this important task has been tendered from such interested agencies as the New Jersey Zinc Co., the United Geophysical Co. of Pasadena, and the U.S. Steel Corporation, as well as from a fellowship furnished by the Shell Petroleum Co.

The new piece of equipment, the only one of its type in the world, resembles an immense tub or small swimming pool, 12 ft. long, 7 ft. wide, and 4 ft. deep. Running lengthwise over the top of this concrete tank is a wooden track which supports the measuring devices, electrical equipment, and ore body to be studied. In actual fact, the tank is a model of the earth, although its appearance is far from the familiar shape. Nearly any condition, so far as relative electrical conductivity of ore and earth is concerned, can be simulated inside the container.

In electromagnetic prospecting, an electrical generator creates an oscillating magnetic field, which fills the



The electro-magnetic model laboratory

surrounding space, just as the earth's steady magnetic field, on a larger scale, everywhere directs the compass needle. When an electrically conducting ore body gets in the way of the oscillating field, the ore distorts the flow lines of the

field, just as a large rock on the bottom of a stream deflects the current and causes a permanent ripple or wake at the surface. Each ore body sends up its typically recognizable kind of ripple.

Currently, a research team is conducting experiments with dry earth—that is, earth which offers no electrical conductivity. For these experiments, the tank is absolutely empty. As the research continues into a study of increasingly wet earth, earth that conducts more and more electricity, the tank will be filled with a brine solution of salt and water. The amount

of salt added can increase or decrease the conductivity of the mixture.

These small-scale investigations will provide response patterns which can help interpret data brought into the laboratory by prospecting parties that have been using field equipment. The research team intimates that it is important to point out that the magnetic field set up in the model is not the same force which occurs naturally about the earth. This is an alternating current field which oscillates 200,000 times per second, as if the magnetic field were reversing its direction 400,000 times every second.

## TECHNICAL BRIEFS

### **Additional Flotation Reagents**

Cyanamid Products Ltd. announce a number of additions to the Cyanamid flotation reagents. Aero Depressant 675 is a complex cyanide which has already been used in the depression of copper minerals in the selective flotation of lead minerals from lead-copper concentrates and should be useful in separating copper in copper-molybdenum ores. Areofroth S-2065 and Aerofroth S-2075 are long chain compounds which show greater selectivity and lower cost per ton than many of the older types of frother.

Aero Promoters 721, 723 and 731 are new additions to the Cyanamid series of fatty acid reagents, and Reagent S-2026 is a new cationic reagent which has been found useful in the flotation of phosphates.

Further technical information on these new reagents can be obtained from Cyanamid Products Ltd. (Mineral Dressing Division), Bush House, Aldwych, W.C.2.

### **A Use For Anthracite Waste**

Substantial fuel savings are likely to accrue from a new process developed by a United States Mining Company for using up the quantities of breaker slush produced in anthracite mining.

By processing the waste through a series of flotation tanks, the firm's engineers have produced a fine anthracite that is being sold to industry for use as a steam fuel. Already, production of this pulverized coal is running at the rate of 200,000 tons a year.

The tiny particles of coal with the soil and other impurities with which they are mixed, are treated with an oil having an affinity for carbon. Water is added and the mixture fed into the first flotation tank where a mechanical agitator keeps it constantly stirred.

A chemical mix is slowly added and this has the effect of forming thousands of tiny air bubbles and mixing with the coal causes it to rise to the surface. The earth and other non-carboniferous matter falls to the bottom of the tank. The tank is then skimmed mechanically and the coal particles led away by a conveyor for drying and storage ready for sale.

Besides providing a cheap fuel for industrial needs, the process has the advantage that it avoids the creation of unsightly heaps of waste or the pollution of river water as occurred in plants where the breaker slush was washed away.

The research that preceded this development has been going forward for the past 20 years and it is interesting that during this time, the engineers arranged to store their waste slush for future use. Their confidence is now completely justified and the firm are busy processing the millions of tons of "waste" just as fast as the reclamation plant can deal with it.

### **A New Range of Welding Electrodes**

Five new electrodes for electric arc welding are announced by Murex Welding Processes Ltd. These electrodes are Speedex, Deepex, Ferex B, Contex and Cinnifex, and all have successfully undergone extensive field trials and have been in use in industry for some time, but in limited quantities mainly owing to the steel shortage.

Speedex is a new mild steel electrode designed to facilitate very high speed manual arc welding under normal operating conditions and with normal penetration. Another special feature of this electrode is that the slag is of the inflated type and it is exceptionally easy to remove, thus enabling further time to be saved on welded work. The electrode is suitable for making downhand butt and fillet welds, and horizontal-vertical fillet welds. The radiographic quality of the weld metal is of a high commercial standard.

Deepex is a new deep penetration electrode designed to produce butt welds in the downhand position in mild steel plate of thicknesses up to  $\frac{1}{2}$  in., without edge preparation. Thicker material can be welded by the adoption of partial preparation. Economies can be made in preparation work when using this electrode.

Ferex B is a low hydrogen type of electrode suitable for the welding of medium alloy steels and mild steel. The electrode

is specially designed to produce welds of high impact value at sub-zero temperatures and to resist cracking in welds made under conditions of restraint. Many of the low and medium alloy steels, which are not weldable with ordinary mild steel electrodes unless a considerable pre-heat is employed, can be welded with this electrode at room temperature or with only a slight pre-heat.

Contex has been designed primarily for the welding of downhand and overhead joints in mild and low alloy high tensile steels by using the touch welding technique. It thus simplifies the production of neat and uniform weld deposits. The electrode is also suitable for vertical up welding, providing a short arc length is maintained. The slag is of the self-releasing type and there is a minimum of spatter and undercut.

Cinnifex is a new type of electrode for welding cast iron, produced essentially for the welding of nodular and other types of cast iron with high ductility. The deposit gives an analysis of 55 per cent nickel and 45 per cent iron. The electrode is also suitable for welding ordinary cast iron where strength is required.

### **Increased Use of Steel Cladding**

The use of the permanent cladding of steel plates with copper, stainless steel, nickel and other metals, has increased over 2,000 per cent between 1939 and 1951, according to the American Iron and Steel Institute. The bonding of metals, although developed in a limited way long ago but not widely used commercially until the 1930's, helps the user to meet requirements that cannot be met with one metal alone. The use of clad steel has also been stimulated because of economic reasons and the need for conserving strategic metals.

Clad steels can be drawn, spun, bent, twisted, flame cut, sheared, punched or otherwise formed as though they were a single metal. When properly made, the two dissimilar metals cannot be physically separated in the normal course of fabrication or in use. There are a number of methods by which the cladding material can be permanently bonded onto the steel. These include the use of heat and pressure, welding, casting and other methods. The method of manufacture most widely used to-day, especially in producing clad steels for use as a material of construction for industrial equipment, is the sandwich method. This method employs heat and pressure to form a permanent bond between the metals.

In the sandwich technique of cladding steel, two slabs of steel form the outer layers. Between the steel slabs are placed two plates of the cladding material which are separated from each other by a special parting compound. The sandwich is welded around the edges so that the components of the pack will not slip or separate during processing and to protect the surface of the cladding material during heating and rolling. The pack is then heated and rolled on a plate mill. After rolling, the welded edges are trimmed from the pack and the sandwich is separated into two clad steel plates, each with the cladding material permanently bonded to the steel backing plate.

The makers of clad steels anticipate an extension of the technique to new fields which is expected to be brought about as greater quantities of such new metals as tantalum, titanium, and zirconium become available.

### **Information on Aluminium Alloy Sheet and Plate**

The Northern Aluminium Co. Ltd. has published a booklet entitled *Noral Sheet Products—Part I* which gives the size limits and manufacturing tolerances of the sheet and plate manufactured by the company.

The aluminium alloys that are available as sheet and plate are of two main classes; non-heat-treatable and heat-treatable alloys. In the former alloys the specified temper is conferred by controlling the amount of gauge reduction in the final rolling operations and recognized tempers are soft (O), quarter hard ( $\frac{1}{4}$  H), half hard ( $\frac{1}{2}$  H), three-quarter hard ( $\frac{3}{4}$  H) and hard (H).

The heat-treatable alloys also work-harden while being rolled to the required gauge, but final mechanical properties are developed by thermal means. The booklet contains full notes on all limits and specifications of manufacture.

## METALS, MINERALS AND ALLOYS

In general, metal prices have continued to show recovery since last week.

In a broadcast to the nation on Tuesday the President of the United States expressed his belief that the Soviet overall policy had not changed and therefore that the free nations must continue to arm. It would seem, therefore, that there is no immediate prospect of a reduction in expenditure on the strategic materials this year. This announcement will further increase existing confidence in America regarding bright business prospects.

Testimony regarding the Simpson Bill continues to evoke lengthy statements pro and con with no indication that the Administration is yielding in its opposition.

**COPPER.**—Demand in the United States for the metal has been good with offerings for June delivery becoming scarcer. The Copper Institute figures for April were noticeable for the heavy deliveries which amounted to 142,282 s.tons as compared with 133,462 s.tons in March, and raising deliveries for the four months of the year to the highest ever recorded except for the war year 1944. Stocks declined to 48,382 s.tons (55,807 in March) and were the lowest since 1951. Production of primary and secondary crude were 95,888 s.tons (101,825 in March), and of refined 112,660 s.tons (112,016 in March).

Outside the United States stocks, however, rose to 146,974 s.tons (133,267 in March) the highest figure since September last. Conversely deliveries were down at 63,215 s.tons (71,420 in March). Crude production was 127,282 s.tons (120,626 in March); and refined 100,101 s.tons (104,926 in March).

The Finance Minister of Chile has reaffirmed that the Government intends to maintain its present selling price of 35½ c. with the local companies being paid 24½ c. per lb.

The high price for copper is continuing to lead to salvage operations from former wrecks. Following on the salvage off the East African Coast, reported in our issue of April 3 last, an attempt is to be made to salvage a cargo of some 500 tons from a schooner sunk on Lake Huron about 1870.

**LEAD.**—This has been a stronger market this week with U.S. prices up a full cent to 13 c. reflecting active consumer demand and reduction in Mexican output owing to strikes. The London market has also risen sharply, Wednesday's close being £88½ prompt and £83½ forward per ton, and this has influenced sentiment in the U.S. The strike at the San Luis Potosi smelter has been ended as have those at the Santa Eulalia Mine and San Francisco Mines of Mexico.

It is reported from Austria that deposits of lead and zinc ore have been discovered near Scharnitz in the Austrian Tyrol. Prospecting in the Inn Valley has had to be abandoned for want of additional capital.

**TIN.**—Prices have continued to improve both here and in the United States.

At a Press Conference in London this week Sir Gerald Templer, while deprecating any undue optimism said that the security position had markedly improved and it was now becoming possible to allow prospecting operations in some areas. Mr. Hopkinson told the House of Commons on Wednesday that in the first quarter of this year 46 tin mines had been closed down in Malaya; mostly speculative concerns floated when tin prices were high.

Straits shipments in the first half of May totalled 2,446 tons of which 1,148 tons went to the United States; 427 tons to the Continent; and 370 tons to the United Kingdom.

Negotiations between Soviet and Indonesian officials in London are reported with regard to tin, rubber, and other raw materials in exchange for machinery.

The International Monetary Fund has agreed to a new par value for the Boliviano. The new rate will be Bs.190 for one U.S. dollar or Bs.6,650,000 per f.oz. of gold, as compared with the previous rate of Bs.60. The Bolivian Government has also purchased \$2,500,000 from the Fund. An export tax at the rate of Bs.35 per dollar will be levied on exports by the Government's Mining Corporation. Quantitative restrictions will still be maintained on international payments.

**ZINC.**—Zinc has also improved appreciably in price on the London Metal Exchange and a moderate demand has been experienced in the United States at the unchanged price of 11 c.

The Mutual Security Agency has so far purchased 4,000 s.tons of high grade zinc from domestic and Canadian sources for shipment to participating countries.

**ALUMINIUM.**—Presiding recently at the annual meeting of Aluminium Ltd., Mr. N. V. Davis said that the company would continue to cultivate the United States market for its production. In the past three years their U.S. sales have averaged 112,000 s.tons, and it was their policy to sell to all fabricators whether they were also producers or not. He believed that internal U.S. producers would find it difficult to satisfy requirements there with low cost metal. Basic reasons explained why Canada was the natural source of supply of part of the U.S. aluminium requirements. Production of the metal called for extraordinarily large amounts of electric power at too low a price to be acceptable to stations supplying populated or industrial areas. Consequently, for its effective development the industry required the utilization of economic sites such as those being developed in British Columbia.

Difficulties are being experienced over the terms which govern financing of companies invited to join the third round expansion of aluminium production, and it is thought that the Wheland Company and Olin Industries will not participate unless more favourable conditions can be secured.

It is announced that the U.S. Administration will extend its stockpiling programme through the third quarter of the year.

**CHROME.**—The American Chrome Company should have its Mount Chrome Mine in Southern Montana in full operation towards the end of the summer. According to the President, the mine is capable of producing 1,000 s.tons of ore per day and contracts have been signed with the Government for delivery of 900,000 s.tons of chromite concentrates over the next eight years. U.S. production in the first two months of the year was 2,047 s.tons and imports were 371,495 s.tons. During the whole of 1952 imports were 1,700,209 s.tons with domestic shipments only 21,303.

**MANGANESE.**—The U.S. Bureau of Mines reports that in January the U.S. imported 289,445 s.tons of ore of 35 per cent or better grade; of which India supplied 101,341, the Union of South Africa 48,468, Cuba 39,487, the Gold Coast 26,402, the Congo 18,446, Brazil 12,825 and Portuguese Asia 10,209 s.tons. Domestic output of manganese alloys was 93,135 s.tons and imports 1,129 s.tons almost entirely from Japan. Stocks of ore in the country are reported as 1,266,690 s.tons.

**MAGNESIUM.**—Production of magnesium in the U.S. in March rose to 10,352 s.tons making a total of 29,338 for the first quarter. Shipments during this period were somewhat in excess of output and producers stocks were reduced to 2,559 s.tons. Most of Government owned plants are scheduled to close down about mid-summer.

**MOLYBDENUM.**—U.S. production of molybdenum concentrates in February is reported at 3,809 s.tons, and shipments 5,381. Exports of concentrates of molybdic oxide decreased and amounted to 548,253 lb. of contained molybdenum of which the U.K. received 479,874 lb., and Canada 67,634 lb.

It is reported from New South Wales that a new seam of molybdenite has been discovered at the old Whipstick Mine near Pambula. The samples are said to be rich.

**NICKEL.**—Herr Krupp Bohlen has visited iron and nickel deposits at Larimna to the North of Athens. The mines are in the hands of the Greek Fertiliser Company and Herr Krupp is understood to be planning equipment for processing nickel ore.

In the U.S.A., nickel is to be rationed on a monthly instead of a quarterly basis after next June.

**QUICKSILVER.**—Exports of quicksilver from Monte Amiata in the first quarter of the year were 323 tonnes, about 100 tonnes in excess of the exports for the same period of 1952.

**SILICON.**—E. I. Du Pont de Nemours has announced the development of a process for the manufacture of pure silicon. The new process will, it is claimed, open up an unlimited source of supply for the manufacture of transistors and rectifiers and other electrical parts. Though production at present is from a

small pilot plant this is yielding sufficient silicon to supply extensive research programmes. It is forecast that pure silicon will compete effectively with germanium, as silicon is one of the most common elements in the earth's crust as compared with the extremely rare element germanium.

**TUNGSTEN.**—Though the U.S. price for imported material has stiffened to \$41.42 per unit f.o.b. port of shipment, considerable grounds for hesitation as to the future exist. It is rumoured that the Government sponsored combine may be liquidated before very long and should that occur there is speculation as to the disposal of any stocks which they hold. Were they to be disposed of the usual experience of lower prices when a market is decontrolled might, it is thought, be repeated.

**GOLD.**—The South African output in April was 981,219 f.oz., of this the Transvaal contributed 956,640 f.oz. and the Orange Free State 24,759. The total for the month compares with 990,115 f.oz. in March. The West Australian output for March is reported as 64,184 f.oz. and for January 58,324 f.oz.

The Colombian output for January and February was 73,312 f.oz. (86,711 for the same period 1952).

**SILVER.**—The President of the Cerro de Pasco stated this week that there has been a fairly steady demand for the metal and he anticipated that the price would remain fairly stable.

## Iron and Steel

Nominally there is now a free market in iron and steel. Production of a licence is no longer necessary before a purchase can be effected. But producers are still enmeshed by their own heavy commitments, and it remains difficult to place an order of any magnitude with the assurance of early delivery.

In this respect makers are hopeful that they will be able to achieve progressive improvement and with the assent of the makers, the bulk of the plants will be kept in continuous operation during the Whitsun and Coronation holidays. But the annual summer holidays are also approaching and a consequent shrinkage of steel production may be unavoidable. It is significant that very big tonnages of both steel series and finished steel products are still being imported to make good the deficiencies in home supplies.

The further expansion of pig iron production is invested with especial urgency. The April output was below the level of the three preceding months and very large tonnages of foreign pig iron have had to be used to bridge the gap. Luckily, scrap supplies have improved and provide a useful cushion in an emergency.

The slackness in the foundry trade still persists, and makers of iron castings find it difficult to maintain a standard of full employment. The engineering foundries on the other hand are very busy and pressure for bigger deliveries of haematite and low phosphorous iron is constant.

There have been indications of late that the overwhelming demand for sheets has passed its peak. There has been a decided reduction in the volume of specifications from consumers and stock holders alike, the effects of which might have been more apparent but for the somewhat fortuitous placing of orders for light sheets for U.S.A. and Canada.

Happily, the sheet mills are well provided with bars and slabs and are assisting in the rolling of light plates. Expansion of the output of the heavy plate mills is also receiving special attention but at best this can only be a slow process and if preference is accorded to the needs of the ship builders it simply means that other important users may have to go short.

Other features of the market are the very active demand for heavy and light tube strip, an expanding market for heavy joists and sections which has been stimulated by the encouragement of capital investment and a fair demand for re-rolled bars which is entirely confined to the home trade, export orders being conspicuous by their absence.

## The London Metal Market

(From Our Metal Exchange Correspondent)

Tin prices have been steadier in sympathy with other metals, and have also been assisted by a better demand from Continental sources. In spite of a decrease in stocks reported at the beginning of the week there have been sufficient sellers of prompt metal to prevent the backwardation increasing. The Eastern price on Thursday morning was equivalent to £772½ per ton c.i.f. Europe.

The decline in copper prices seems to have been arrested and the demand for sterling material has increased, resulting in a price rise of as much as £10 a ton, bringing the European price level to around £240 per ton ex works for wire bars. The scrap markets have also improved, except in the U.K. where stocks continue to accumulate owing to the prohibition on export, and there seems little hope that this will be lifted.

A better demand for lead in America has enabled the price there to be raised. A sympathetic movement has taken place in London, and at the same time increased demand on the Continent has resulted in the ex-smelter price rising to a premium of about 20s. over the London quotation.

The zinc market has been disappointing, the only feature being a substantial off-take of metal bought from the Government Broker, which, it is believed, was taken in high-grade brands for shipment to America against recent purchases there by the Mutual Security Agency. Trade elsewhere is normal and, therefore, without influence on the price.

Closing prices and turnovers for the week are given in the following table:

	Buyers May 14	Sellers May 14	Buyers May 21	Sellers May 21
Tin				
Cash .....	£757½	£760	£747½	£752½
Three months .....	£742½	£747½	£737½	£742½
Settlement .....	£757½		£750	
Week's turnover....	665 tons		560 tons	
Lead				
Current month ....	£81½	£81½	£87	£87½
Three months .....	£80	£80½	£82	£82½
Week's turnover....	3,725 tons		5,600 tons	
Zinc				
Current month ....	£69½	£70	£71	£71½
Three months .....	£69½	£70½	£71	£71½
Week's turnover....	6,350 tons		3,800 tons	

### MAY 21 PRICES

#### COPPER

Electrolytic ... . . . . £253 0 0 d/d

#### TIN, LEAD AND ZINC

(See our London Metal Exchange report for Thursday's prices)

#### ANTIMONY

English (99%) delivered,			
10 cwt. and over	..	..	£225 per ton
Crude (70%)	..	..	£210 per ton
Ore (60% basis)	..	..	20s. — 22s. nom. per unit, c.i.f.

#### NICKEL

99.5% (home trade) .. . £483 per ton

#### OTHER METALS

Aluminium, £161 per ton	Osmiridium, £40 oz. nom.
Bismuth	Osmium, £65/70 oz. nom.
(min. 4 cwt. lots) 17s. lb.	Palladium, £7 15s./£8 10s. oz.
Cadmium (Empire), 14s. 4d. lb.	Platinum, £27/£33 5s.
Chromium, 6s. 5d./7s. 6d. lb.	Rhodium, £42 10s. oz.
Cobalt, 20s. lb.	Ruthenium, £25 oz.
Gold, 248s. f.oz.	Quicksilver, £70 10s./£71 ex-warehouse
Iridium, £60 oz. nom.	Selenium, 30s. 6d. nom. per lb.
Magnesium, 2s. 10d. lb.	Silver 74d. f.oz. spot and f.d.
Manganese Metal (96%-98%)	Tellurium, 15s./16s. lb.
£280/£295	

#### ORES, ALLOYS, ETC.

Bismuth .. . . .	50% 7s. 9d. lb. c.i.f.
Chrome Ore—	40% 6s. 9d. lb. c.i.f.
Rhodesian Metallurgical (lumpy)	£14 18s. per ton c.i.f.
" " (concentrates)	£14 18s. per ton c.i.f.
" " Refractory	£14 10s. per ton c.i.f.
Baluchistan Metallurgical	£16 11s. 6d. per ton c.i.f.
Magnesite, ground calcined	£26 - £27 d/d
Magnesite, Raw .. .	£10 - £11 d/d
Molybdenite (85% basis)	103s. 10d. per unit c.i.f.
Wolfram (65%) .. .	World buying 305s. - 315s. 352s. 6d. Selling
Scheelite .. . . .	World buying 290s. - 300s. 342s. 6d. Selling
Tungsten Metal Powder .. .	25s. 9d. nom. per lb. (home)
(for steel manufacture)	
Ferro-tungsten .. . .	22s. 10d. nom. per lb. (home)
Carbide, 4-cwt. lots .. .	£35 13s. 9d. d/d per ton
Ferro-manganese, home .. .	£49 15s. 0d. per ton
Manganese Ore U.K.	
(48%-50%) .. . .	6s. 1d. per unit
Brass Wire .. . .	2s. 7½d. per lb. basis
Brass Tubes, solid drawn .. .	2s. 1½d. per lb. basis

## THE MINING MARKETS

(By Our Stock Exchange Correspondent)

Markets this week were very quiet. Gilt-edged were firm although finishing the week a little below the best. General trading conditions can be attributed to the Egyptian crisis, the prospect of further trade competition overseas, and the recent talks on the future flotation of steel stocks.

Kaffirs began the period weakly but improved towards the close of the account. The gains, however, were not sufficient to wipe out previous losses. The rise was attributed to a certain amount of selective buying from Johannesburg and technical conditions in London. There was little real investment interest, Crown Mines were better on break-up hopes. The existence of a large dyke has considerably shortened the potential life of this old property. News has now been received that the Daggafontein uranium plant is likely to be four times larger than that of West Rand Consolidated. It must be emphasized, however, that this does not necessarily mean four times the profits. The chairman of West Rand Consolidated stated that although there has been teething troubles in the uranium plant, the results were up to expectations and the Board was confident that material improvement might be expected. The free price of gold continued to decline and the prospect of lower June dividends can probably account for the lack of interest in this market. Nevertheless, it does seem that uranium factors have not been fully recognized.

The Freddies group and other volatile counters improved on speculative buying. St.-Helena hardened after the meeting. The shares are still at a very low level. The report stated that development had been hindered by the necessity to carry out further cementation. This can be expected to add to costs.

Leading shares in the West African group were down due to the Nigerian riots. The Gold Coast Selection Trust figures for the March quarter record better profits for Bremang and Marlu, but those for Amalgamated Banket, Gold Coast Main Reef and Ariston declined.

Western Australian gold shares were little changed. The Great Boulder Proprietary figures gave some encouragement.

FINANCE	Price May 20	+ or -	O.F.S.	Price May 20	+ or -	MISCELLANEOUS GOLD (contd.)	Price May 20	+ or -	TIN (Nigerian and Miscellaneous) contd.	Price May 20	+ or -
African & European..	2 ½	-	Freddies	12/-	-	St. John d'El Rey.....	24/-xd	-1/-	Geevor Tin.....	9/9	+3d
Anglo American Corp..	5%	-	Freddies N.	11/6	+ 3d	Zams.....	25/-	-7 1/2d	Gold & Base Metal.....	3/6	-3d
Anglo-French .....	17/6	-	Fred. Geduld S.	11/13	+ 1d	DIAMONDS & PLATINUM			Jantar Nigeria.....	13/3	-
Anglo Transvaal Consol.	22/6	-	F. S. Geduld	2 3/4	+ b	American Inv. ....	4 1/2	-1 1/2	Jos Tin Area.....	13/-	+6d
Central Mining (£1 shrs.)	29/44	-	Geoffries	15/6	+ 7 1/2d	Casts.....	19/6xd	-2/3	Kaduna Prospectors.....	2/9	-
Consolidated Goldfields Consol. Mines Selection	44/9	-	Harmony	25/-	-	Cons. Diam. of S.W.A. ....	64/3	-6d	Kaduna Syndicate.....	3/-	+3d
East Rand Consols.	23/1 1/2	-	Lorraine	8/9	+ 4 1/2d	De Beers Dfd. Bearer.....	15/-	+ 1/2	London Tin.....	4/9xd	-
General Mining .....	3/-	-	Lydenburg Estates	11/6	+ 9d	De Beers Pfd. Bearer.....	7/6	-	United Tin.....	2/6	+ 1 1/2d
H.E. Prop. ....	40/7 1/2	-	Merriespruit	7/6	-	Pots Platinum.....	7/6	-	SILVER, LEAD, ZINC		
Henderson's Transvaal.	7/3	-	Middle Wits	16/9	+ 1d	Wateraal.....	14/6	-	Broken Hill South.....	42/6	+ 1/3
Johnhies .....	58/9	-	Ofisits	36/10 1/2	+ 1 1/2d	COPPER			Burma Min. ....	1/7	-
Rand Mines .....	34	-	President Brand	24/9	+ 1d	Chartered.....	50/6	+ 3d	Consol. Mine.....	24/xd	-1/12
Rand Selection .....	31/3	-	President Steyn	23/3	-	Esperanza.....	3/9	+ 1 1/2d	Lake George.....	9/10 1/2	-
Strathmore Consol. ....	32/6	-	St. Helena	12/11	-	Indian Copper.....	4/3	-	Mount Isa.....	33/9	+6d
Union Corp. (2 1/2 units)	27/-	-	Welkom	13/6	-	Messina.....	3/4	-	New Broken Hill.....	18/11xd	-10 1/2d
Vereeniging Estates .....	3 1/2	-	Western Holdings	19/6	-	Nchanga.....	5/5	-	North Broken Hill.....	50/-	-7 1/2d
Writs .....	32/6	-		3 1/2	-	Rhod. Anglo-American	47/3	+ 2/-	Rhodesian Broken Hill.....	10/6	+ 3d
West Wits .....	45/7 1/2	-			-	Rhodesian Selection.....	12/6	+ 1 1/2d	San Francisco Mines.....	21/9	-6d
RAND GOLD						Rhokana.....	17/4	+ 1 1/2d	Uruwira.....	2/10 1/2	-3d
Blyvoors .....	40/9	-	WEST AFRICAN GOLD			Rio Tinto.....	19/xd	-	MISCELLANEOUS BASE METALS & COAL		
Brakpan .....	9/9	-	Amalgamated Banket.	1/6	-	Roan Antelope.....	12/3	+ 3d	Amal. Collieries of S.A. ....	45/6	-
City Deep .....	20/7 1/2	-	Ariston	6/3	-	Selection Trust.....	39/-	-	Associated Manganese.....	45/3	+ 1/9
Consol. Main Reef .....	21/10 1/2	-	Aschanti	21/6	-	Tanks.....	55/6	-9d	Cape Asbestos.....	20/1 1/2	-10 1/2d
Crown .....	31/10 1/2	-	Bibiani	6/1 1/2	-	Tharsis Sulphur Br. ....	41/3	-1/3	C.P. Manganese.....	49/9xd	-5 1/2d
Daggas .....	3 3/2	-	Bremang	2/6	-	TIN (Eastern)			Consol. Murchison.....	26/3	-
Doornfontein .....	26/-	-	G.C. Main Reef	3/6	-	Ayer Hitam.....	21/10 1/2	+ 7 1/2d	Mashaba.....	7 1/2	-
Durban Deep .....	38/9	-	G.C. Selection Trust	6/1 1/2	-	Bangrin.....	6/1	+ 4 1/2d	Natal Navigation.....	-	-15
E. Daggas .....	16/10 1/2	-	Konkomo	2/7 1/2	+ 1d	Gopeng.....	8/-	-6d	Rhod. Monteleo.....	8/9	-
E. Geduld .....	33/1 1/2	-	Lyndhurst Deep.	1/14xd	+ 1 1/2d	Hongkong.....	7/3	-	Turner & Newall.....	48/6	-1/9
E. Rand Props. (4/- units)	3/1-10 1/2	-	Marlu	1/4 1/2	+ 1d	Ipoh.....	14/4	-	Wankie.....	13/7 1/2	-1 1/4d
E. Rand Props. ....	2 1/2	-	Taquaal & Abosso	3/3	-	Kamunting.....	8/1 1/2	-	Witbank Colliery.....	3 1/2	+ 1/2
Geduld .....	4 1/2	-			-	Kepong Dredging.....	5/-	-	CANADIAN MINES		
Govt. Areas .....	13/3	-	AUSTRALIAN GOLD			Kinta Tin Mines.....	10/3	-	Dome.....	\$35/-	+ 1/2
Grootvlei .....	22/-	-	Boulder Perseverance	2/1 1/2	-	Malayan Dredging.....	13/-	-	Hollinger.....	\$25/-	-
Libanon .....	10/9	-	Gold Mines of Kalgoorlie	11/4 1/2	+ 1 1/2d	pahang.....	10/3	-	Hudson Bay Mining.....	\$78	-3
Luipaards Vlei .....	25/-	-	Great Boulder Prop.	7/3	-	Pengkalen.....	13/-	-	International Nickel.....	\$71 1/2	-
Marievale .....	21/-	-	Lake View and Star.	14/9	-	Petaling.....	10/4	-	Mining Corp. of Canada.....	\$43	-
Modderfontein East .....	18/9	-	Mount Morgan.	17/9	-	Rambang.....	11/3	-	Noranda.....	\$123	-
New Kleinfontein .....	21/10 1/2	-	North Kalgoorlie	11/9	-	Siameso Tin.....	18/3	-	Quemont.....	£64	-
New Pioneer .....	20/7 1/2	-	Sons of Gwalia.	6/3	-	Southern Kinta.....	13/6	-	Yukon.....	3/10 1/2	-1 1/2d
Randfontein .....	42/-	-	South Kalgoorlie.	7/4	-	S. Malay.....	22/9	-	OL		
Robinson Deep .....	9/9	-	Western Mining	12/6	-	S. Tronoh.....	9/6	-	Anglo-Iranian.....	5 1/2	-
Rose Deep .....	13/9	-			-	Sungei Kinta.....	13/1	-	Apex.....	38/9	-1/3
Simmer & Jack .....	5/-	-	MISCELLANEOUS GOLD			Tekka Taiping.....	4/9	-	Attack.....	26/3	-
S.A. Lands .....	25/-	-	Cam and Motor	9/7 1/2	-	Tronoh.....	21/3	-	Burmah.....	46/3	-1/104
Springs .....	5/3	-	Champion Reef	5/-	-	TIN (Nigerian and Miscellaneous)			Canadian Eagle.....	32/4xd	-1/-
Stillfontein .....	27/-	-	Falcon Mines	7/-	-	Amalgamated Tin.....	9/-	-	Mexican Eagle.....	20/9	-1 1/2d
Sub Nigel .....	2 1/2	-	Globe & Phoenix.	24/6	-	Berali Tin.....	25/7	-	Shell (bearer).....	4 1/2xd	-10
Van Dyk .....	8/6	-	G.F. Rhodesian	5/1 1/2	-	Bisichi.....	3/9	-	Trinidad Leasehold.....	24/3xd	-1/3
Venterspost .....	13/9	-	London & Rhodesian	4/3	-	British Tin Inv. ....	12/6	-	T.P.D. ....	21/3	-9d
Vlakfontein .....	14/-	-	Matopha	2/4 1/2	-	Ex-Lands Nigeria.....	3/10	-	Ultramar.....	22/9	-
Vogelstruisbul .....	32/6	-	Mysoore	2/10 1/2	-						
West Driefontein .....	6 1/2	-	Nundydroog	5/9	-						
W. Rand Consolidated .....	53/9	-	Oregeum	2/9	-						
Western Reefs .....	46/10	-	Oroville	10/3	-						

## COMPANY NEWS AND VIEWS

### **Smaller Diamond Sales of De Beers in 1952**

The full report and accounts of De Beers Consolidated Mines for the year 1952 showed that the drop in earnings recently announced was due wholly to a large reduction in diamond sales.

Interest and dividend revenue, which usually provide roughly half of the company's total income, increased by £155,429 to £7,077,612, and income from other sources amounted to £232,943. Earnings from diamond sales, however, at £7,694,555 showed a decrease of £1,156,171 compared with the previous year. For a year during which world sales, at approximately £70,000,000, established a new high record, this result was as surprising as it was unexpected. Its cause was attributable chiefly to a decrease in output from the Dutoitspan Mine which operated daily shifts of only 8 hours daily compared with 11-hour daily shifts during 1951. Contributory causes were the decrease in production and deliveries from Jagersfontein Mine and Kleinzee due to a drop in the grade at these properties, and similarly from a decrease in the working of sundry old surface dumps at Kimberley, where the diamond contents varies considerably.

Total income for the year at £15,005,110 showed a decline of £783,455, and as expenditure rose by approximately £238,000, untaxed profits fell by £1,021,156 to £11,917,399. However, taxation charges at £1,825,000 were £775,000 less and the year's dividend, maintained at 10s. per 5s. share, was amply covered. Script dividends received from the Diamond Corporation amounting to £10,400,000 enabled the company to allocate £2,500,000 to general reserve, and to provide £7,849,966 to cover the cost of fixed assets required during the year.

The consolidated balance sheet of the company and its subsidiaries, which is included with the accounts for the first time, is an impressive document. Current assets amounted to £37,733,312, of which £8,441,287 was represented by Government and Local Authority Securities and Loans, £14,841,635 by loans at call, and £1,083,145 by cash. Additionally, diamonds on hand, valued at cost, or market value if lower, were recorded at £6,614,392; investments—both quoted and unquoted—at £14,361,467; fixed assets at £17,869,156; and the total consolidated assets were entered at no less than £105,038,044.

### **"Corner House" Higher Net Group Profits**

Share dealings contribute erratically towards the earnings of the Rand mining-finance companies and as 1952 was not a good year generally for market transactions, the Central Mining and Investment Corporation's income from this source was whittled down; it amounted to £27,892 as against £262,787 in 1951 when, during part of the year, there were good opportunities for share dealings. Fortunately, dividend income, through the Corporation's judicious selection of stocks and shares, forms the greater part of its revenue which last year was as good as maintained—£837,889 compared with £845,889. An increase of nearly £500,000 to £8,804,156 in holdings of shares, investments and interests is shown by the combined group balance sheet, with gold mining interests rising to £6,171,127 from £5,676,665. The market value of investments is not ascertainable but it is believed to be substantially higher than book value. Reduction in gross income was substantially off-set by a lower taxation requirement, so that the net group profit of £489,496 was £69,658 above the 1951 level.

The Corporation has brought to fruition some of the best Central Rand gold producers and at present controls a dozen of the largest mines. It is less prominent in the Orange Free State but pursuant to its policy of extending its interests it formed the Central Mining Free State Areas and has under its technical control the Harmony Gold Mine, which is being brought to production. Its large portfolio of share interests include St. Helena, Welkom Gold, Western Holdings, etc.; it is interested in lead, zinc and Rhodesian copper, land, timber, and forestry. Coal participations are represented by holdings in South African Coal Estates and Witbank Colliery which it controls, while an interest in a potential platinum property in the Transvaal is derived from a substantial holding in Transvaal Consolidated Land.

As with other leading Kaffir Houses, the Corporation has ventured into industrial undertakings—Northern Lime, Pretoria Portland Cement and has been well rewarded by money put into the Hume Pipe Company. A successful oil enterprise, in which money has been invested with profitable results is the well-known Trinidad Leaseholds.

The annual report contains facts and comparative figures of the South African gold mining industry, amplified by an interesting graph and records of tonnages, profits, costs, etc.

Although most of the Rand producers of the group are old, at recent meetings the chairmen have been able to give some encouraging news. Provided costs are held, the grade of ore at Crown Mines is expected to be maintained with improving operational results. At City Deep, where the big programme of sinking the K line of sub-incline shafts, is well in hand, a longwall system of mining is being followed in place of top-cut rescue method of stoping. Durban Deep has made application for additional claims; it is opening up a new reef horizon and is engaged on a programme of shaft sinking. Increased efficiency has resulted from reorganizing and modifying the existing layout at Rose Deep. The encouraging news given in East Rand Proprietary's annual report was amplified by the chairman at the meeting though he was perforce obliged to sound a warning on account of labour shortage.

The remarks of the chairmen of these Rand companies are published on pages 617 to 620 of this issue.

### **A. and E.'s Successful Year**

A very successful showing is made by African and European Investment for the year to December 31, 1952; a strong balance sheet is presented, dividend income is up, revenue from various sources increased and the Ordinary and Preference dividend are well covered.

The company is one of the long-established finance undertakings brought into being many years ago when prospects for the financing and development of South Africa's gold and coal looked very encouraging. Opportunities presented were taken up by African and European and since coming under the technical control of the Anglo American Corporation, there has been a substantial broadening of interests. Through its early incursion into the Orange Free State it became possessed of the mineral rights over what was at one time known as Block 8 which subsequently led to the company becoming substantially interested in Welkom Gold, President Brand and President Steyn. These have been added to the company's large colliery interests with which it has always been associated through the Vereeniging Estates; they include Amalgamated Collieries of South Africa, S.A. Coal Estates (Witbank), Coronation Collieries and Vryheid Coronation. Additionally the company has farming interests, land and town properties together with a valuable portfolio of shares in Rand and Orange Free State companies. It derives substantial income from dividends and share dealings and during 1952 total revenue was up from £977,650 in the previous year to £1,080,420. Quoted investments of £7,367,150 had a market value of £10,776,909. Comparative items are:

	1951	1952
Dividend income .....	£309,483	£430,223
Profit on share dealings .....	£460,158	£403,511
Property sales .....	£179,369	Nil
Other income .....	£208,013	£246,689
Expenses, etc. ....	£121,123	£151,079
Taxation .....	£114,000	£155,000
Ord. and Pref. dividends .....	£413,523	£430,000
Ordinary dividend per share ....	2s. 6d.	2s. 6d.
To reserve .....	£355,000	£250,000
Current assets .....	£1,198,514	£1,641,219
Current liabilities .....	£714,113	£785,907

### **Gold Fields Australian Better Showing**

When the Gold Fields Australian Development Company was brought into being in 1932, there seemed to be good prospects of its interests developing well and becoming of much value. It held the entire issued capital of Moonlight Wiluna, which owns gold leases at Wiluna and a 25 per cent interest in

Mount Charlotte. The company also had the Mount Ida gold mine and an interest in the Porphyry. There was also a participation in Yellowdine Gold. Other properties have been investigated and G.F. Australia has been actively engaged in various directions but it has not had the best of luck. It was at one time thought the American Smelting and Refining Company might interest itself in the Mount Charlotte but following disappointing results obtained below the 500 ft. level, it withdrew from its agreement to finance operations. Energies were then directed mostly to the Mount Ida mine which is situated some 140 miles north-west of Kalgoorlie. Before the war the mine was producing on a small scale but was forced in 1943 to slow down operations and was put on a care and maintenance basis. A restart of operations was made in 1946 and it was decided to concentrate on development in depth. This has proved to be the right policy and, although no very large aggregation of ore reserves have been established, good ore of payable grade has been opened up.

During the year to December 31, 1952, notwithstanding depleted labour the footage of development on Mount Ida amounted to 2,027 ft., with encouraging results. Ore crushed at the mill amounted to 25,758 tons, yielding 10,999 oz. gold, or an average of 8.99 dwt. per ton, while in addition 670 oz. were derived from the re-treatment of accumulated residues. The result was that the company made a profit of £30,626 which reduced the group loss carried forward to £84,638.

#### Lyndhurst Deep Conjoint Working

The arrangement made by Lyndhurst Deep with the adjoining Konongo Mines (in which it holds 2,708,411 shares) has been of benefit to both companies. Their properties are situated in Ashanti, West Africa, and the position is that Lyndhurst (which has no plant of its own) took advantage of the offer made by Konongo to put the surplus capacity of its plant at the former's disposal. During the year to December 31, 1952, 15,145 tons were treated (against 19,170 tons) yielding 14,669 oz. (17,202 oz.). Working costs, excluding development were 116s. 7d. compared with 88s. 10d. Proceeds of bullion amounted to £197,377, and profit on operations to £42,048. Additionally £27,084 was received from dividend on investment, sundry revenue brought in £3,199, and after taking into account £31,189 brought forward there was an available balance of £103,520. Dividend was 25 per cent against 15 per cent previously absorbing £60,500.

The results of development work done during the year were disappointing, only 90 ft. of driving on the fissure proving payable, averaging 18.3 dwt. per ton over 66 in. Total footage was 1,609 ft., while in addition, drilling was done on 18 boreholes. No occurrences of economic importance were found as a result of surface prospecting. The one quartz reef with encouraging values in the Odumase Concession close to the Konongo boundary is to be tested on the 9th level, being driven from Konongo for the purpose. The latest computation of ore reserves puts the figure at 39,460 tons of 16 dwt.—a decrease of 13,690 tons, grade remaining the same. The bulk of the ore treated was taken from the reserves.

#### Halkyn United Pays 15 Per Cent

Halkyn District United Mines, the Flintshire lead and zinc producer, made good progress during 1952, although the fall in the average price of lead over the year caused working profit to contract by some £43,000 compared with 1951.

The mill throughput during the year increased from 24,709 tons ore to 29,123 tons, from which 2,590 tons of lead concentrates were recovered against 2,155 tons in the preceding year. Additionally, zinc concentrates produced advanced from 266 to 353 tons.

As in the previous year a greater part of the production was obtained from lodes 530 and 524. Lode 530 has been exposed over a length of 1,400 ft. at tunnel level and to a height, in places, of 225 ft., and on the average shows satisfactory mineralization. Lode 524 has been exposed over lengths of 1,100 ft. at tunnel level, at a maximum height of 275 ft. with average values better than were disclosed in the earlier stages of development.

The profit and loss account summarized in the table below calls for a little comment. The dividend distribution of 9d. per

5s. stock unit compares with 1s. 6d. in the previous year. In this connection it will be recalled that a reduction of the company's capital became effective on January 26 last from which date the 5s. stock unit have been reduced to 2s. and the total nominal issued capital has been reduced from £205,675 15s. to £82,270 6s.; the difference between these two amounts, namely, £123,405 9s. being for the most part already repaid to stockholders.

Year to Dec. 31	Working Profit	Taxation Off	Written Balance	Free * Divid. £	Carry Forward £
	£	£	£	£	£
1952	124,449	80,500	17,059	27,492	16,968 22,070
1951	167,490	100,971	28,715	37,804	32,394 11,847

\* Includes a capital profit of £301.

The current prices for both lead and zinc are, of course, substantially below the average prices on which the 1952 profit was earned and will, no doubt, result in a recalculation of the company's ore reserves which at the end of 1951 were estimated to be equivalent to 9,000 tons of lead concentrates.

Mr. R. W. Bankes is chairman. Meeting, Blossoms Hotel, Chester, June 4.

## Company Shorts

**Roan and Mufulira Profits rise in March Quarter.**—The March quarterly revenue statements of Roan Antelope and Mufulira show that both companies made a sharp recovery from the previous three months which included the period of the three week strike of African employees.

Mufulira's earnings rose by nearly 30 per cent to £2,116,000 but this increase still fell short of the September quarter's result by nearly £1,000,000.

Roan's profits, however, increased by approximately 77 per cent to £3,063,000 which virtually restored the company's earnings to its September quarter's level.

In any event, both companies' profits for the first 9 months of the financial year are about £1,800,000 higher than in the corresponding period of 1951-52, the estimated profit before tax for the nine months ending March 31 last of Mufulira being £6,850,000 against £5,067,000, the comparable figures for Roan being £7,873,000 against £7,087,000.

	June Qtr.	Sept. Qtr.	Dec. Qtr.	Mar. Qtr.
	(l.tons)	(l.tons)	(l.tons)	(l.tons)
<b>Mufulira</b>				
Sales .....	28,424 (\$'000)	21,961 (\$'000)	14,201 (\$'000)	16,156 (\$'000)
Revenue .....	5,931	5,309	3,388	4,152
Costs .....	2,302	1,765	1,995	1,836
Difference in value of copper stocks .....	Dr. 175	Dr. 227	Cr. 502	Cr. 30
Surplus .....	3,454	3,317	1,895	2,346
London expenses .....	2	Cr. 13	Cr. 9	Cr. 20
Replacements* .....	250	250	250	250
Profit before taxation† .....	3,202	3,080	1,654	2,116
<b>Roan Antelope</b>				
Sales .....	21,691 (\$'000)	22,338 (\$'000)	15,499 (\$'000)	23,012 (\$'000)
Revenue .....	4,526	5,400	3,699	5,853
Costs .....	2,002	2,236	1,890	2,569
Difference in value of copper stocks .....	Cr. 24	Cr. 178	Cr. 164	Cr. 17
Surplus .....	2,548	3,342	1,973	3,301
London expenses .....	Cr. 4	6	Cr. 1	Nil
Replacements* .....	250	250	250	250
Profit before taxation† .....	2,302	3,086	1,724	3,063

\* Subject to revision when year's accounts considered.

† Estimated.

Mufulira announced that it has made arrangements with the Defence Materials Procurement Agency (D.M.P.A.) of the U.S. Government for the additional finance necessary to bring the company's subsidiary, Chibuluma Mines, into production. Originally the cost of bringing this mine into production was estimated at £3,600,000, but it is now estimated that the cost of equipping and developing it will be £6,000,000, the increase being due mainly to substantial unforeseen increases in the cost of equipment, materials and labour and to advances in housing standards and town planning.

Under the new arrangement D.M.P.A. will increase its unsecured loan of £3,000,000 to Chibuluma Mines by up to £2,000,000 and Mufulira will subscribe for a further 400,000 £1 shares thereby raising its share interest in the company to £1,000,000.

It is also announced that recent experience at the Chibuluma property has suggested that the start of copper production will be possible during the latter half of 1955 instead of during 1956 as was originally contemplated. Further favourable indications, it is stated, have been obtained as to the grade of ore and its amenability to treatment. In this connection the U.S. Government will now have a prior option on 19 per cent of Chibuluma's cobalt output compared with 10 per cent as originally envisaged. This increase follows on the fact that the additional £2,000,000 D.M.P.A. loan, like the original £3,000,000 loan, is repayable in metals.

**G.C. Selection Trust's March Quarterlies.**—With the exception of Marlu Gold Mining Areas, whose working profit for the March quarter shows an advance of nearly £15,000 over the previous quarter's results, the remaining four West African gold producers in the Gold Coast Selection Trust group all announced lower profits. On the other hand, the results announced compare favourably with those obtained in the March quarter 1952. In some respects, this is probably the most useful way of comparing the returns as this quarter includes the shorter working month of February.

On this basis, Amalgamated Banket's profits compare with £87,150 in the March quarter 1952 while Ariston shows a decline of approximately £5,000, the result achieved in the same quarter a year ago being £155,265. But Bremang's current profits are nearly double those of a year ago when the figure returned was £24,428.

Gold Coast Main Reef, in addition to the steady profits figures given in the table below, earned a working profit of £40,430 in the March quarter of 1952. Marlu Gold's quarterly result contrasts sharply with that of a year ago, when profits amounted to £22,732.

Company	June Qtr. (1952)	Sept. Qtr. (1952)	Dec. Qtr. (1952)	Mar. Qtr. (1953)
	£	£	£	£
Amalgamated Banket	67,617	94,786	92,475	74,168
Ariston Gold Mines	144,166	166,011	170,443	150,087
Bremang Gold	75,743	59,059	11,202*	44,331
Gold Coast Main Reef	37,137	39,334	44,735	41,247
Marlu Gold	... 19,853	35,938	35,658	50,035

\* Total excludes £1,963 recovered from a clean-up.

During the March quarter 1953 Amalgamated Banket achieved some good results in the Mantraim Vertical Shaft section and the company also announced that the completion of the ropeway from the Fanti section to the Central Mill was expected to be completed in June.

Ariston kept its development expenditure down to £8,847 which compares with £7,602 in the previous quarter. A cross-cut on the No. 2 ore body on level 24 exposed values averaging 10.6 dwt. over a width of 121 in.

Bremang announced that the reconstruction of its No. 2 dredge on the Offin River is proceeding satisfactorily. Gold Coast Main Reef reported some good development results on level 15 in the Bondy Main Shaft section and also on level 13 in the Tuappim section. Marlu Gold announced that expenditure on capital account had been reduced to nil.

**Inco's Net Sales up in March Quarter.**—The report of the International Nickel Company of Canada and subsidiaries for the three months ended March 31, 1953, showed net earnings in terms of U.S. currency of \$15,590,551 after all charges, depreciation, depletion, taxes, etc., equivalent after preferred dividend, to \$1.03 per common share. In the previous quarter net earnings equalled 87 c. per common share while net earnings in the first quarter of 1952 at \$16,346,318 were equivalent to \$1.08 per common share.

**Pari Tin's Good Offer.**—A proposal has been made to the Board of Pari Tin, through a firm of chartered accountants, for the purchase of the Company's issued shares at a price of 6s. 3d. per share, payable in cash, which is in excess of the distribution expected to be made if the Company is put into liquidation. The obvious advantage of this proposal to shareholders has led the Board to recommend its acceptance and also to adjourn the extraordinary general meeting called for May 14, at which a special resolution was to be submitted to put the Company into voluntary liquidation.

**John Mills and Co. (Llanidloes) Ltd.**, Engineers and Machine Tool Manufacturers, have announced that Mr. F. D. W. Roach, 14 Swinburne Road, Darlington, County Durham, has been appointed agent for Northumberland, Cumberland and Durham, and that Mr. L. C. Ellison, Clyne, Highfield Close, Canterbury, Kent, has been appointed for the South-East area.

**The Institution of Mining and Metallurgy** will hold its annual general meeting in the Apartments of the Geological Society of London, Burlington House, Piccadilly, London, W.1, on Thursday, May 28, at 4 p.m.

## THE RHODESIA BROKEN HILL DEVELOPMENT COMPANY

The forty-third annual general meeting of The Rhodesia Broken Hill Development Company Limited will be held on June 12 in Nkana, Northern Rhodesia.

The following is the statement by the Chairman, Sir Ernest Oppenheimer, dated April 1953, circulated with the annual report and accounts for the year ended December 31, 1952:

Members will recollect that in the statement which I made in May, 1952, I emphasized that the results of that year's operations, which established new records, were not likely to be repeated in 1952. This has proved to be the case as the operating profit for last year, at £2,800,000, is approximately half that earned in the previous year. This decrease is due to the fall in selling prices of metals produced. Production and costs were satisfactory throughout the year. The net profit after taxation amounted to £1,800,000, from which £500,000 has been appropriated to capital reserve.

This appropriation is made in pursuance of the Board's policy to finance capital commitments primarily out of profits. The £500,000 is intended firstly to provide funds for the enhanced cost of the new lead plant and secondly will be utilized for further capital expenditure to be incurred in the current year. In this connection the company intends erecting a lead desilverizing plant to ensure that the lead produced conforms to the highest purity standards. It is also intended to erect a plant for the production of refined cadmium, which has not hitherto been recovered.

The new lead plant has been brought into commission and a certain amount of trouble has been experienced, resulting in several shut-downs. These initial troubles have, however, been overcome and it is anticipated that the plant will now continue to operate satisfactorily. Whilst the shut-downs resulted in a certain loss of production, this was minimized by bringing the old plant back into commission.

In addition to the proved ore reserves at December 31, 1952, it is estimated that 290,000 s.tons of recoverable sulphide ore and 160,000 s.tons of recoverable oxide ore have been indicated below the 650 ft. level in No. 5/6 orebody; the previous figure was 238,000 s.tons and related only to sulphide ore.

Under the heading of African Labour, the Consulting Engineers in their report refer to the strike which took place on the Copperbelt in October/November, 1952, in support of a demand by the Northern Rhodesian African Mineworkers' Union for an increase in wages of 2s. 8d. per shift, or 80s. per ticket of 30 shifts. This strike did not extend to Broken Hill, but since the company's policy is to pay its African employees the same basic wages as those on the Copperbelt, they have received the benefit of pay increases ranging from 35s. to 50s. per ticket awarded at the Arbitration proceedings which followed the strike, and additionally they now get extra pay for Sunday work and for afternoon and night shifts.

The London Metal Exchange reopened for dealings in lead on October 1, 1952, and for zinc on January 2, 1953, and in both cases the announcement of the proposed reopening accentuated the weakness in these metals which had been developing since the beginning of 1952. To some extent this weakness can be attributed to buyers holding off to see what effect free market dealings would have on prices, and, although this might have been expected to be a temporary phase, the fact remains that up to date neither metal has yet recovered from the initial weakness.

### RHOANGLO GROUP BILL

An extraordinary general meeting of members was held on January 28, 1953, to give formal approval to the presentation to the United Kingdom Parliament of the Rhoanglo Group Bill, which may well be enacted by the time this statement is in the members' hands. If the Bill is passed this company, together with Rhodesian Anglo American Limited and its allied copper companies, will become reincorporated in Northern Rhodesia, thus finalizing the move from the United Kingdom which took place at the end of 1950. It is anticipated that re-registration will be effected early in 1954. Thereupon the company's principal share register will be maintained at Kitwe, but the company proposes, for the convenience of members, to set up branch registers in London and Johannesburg in substitution for the Principal and Branch Registers now maintained there. The implementation of these proposals is conditional upon the local Companies Ordinance being amended and it affords me much pleasure to take this opportunity of acknowledging the extremely co-operative attitude of the Northern Rhodesia Government authorities to the representations made in connection with the local re-registration of this and other companies of the Rhoanglo Group.

In conclusion, I have pleasure in recording that I consider that the past year's results have been satisfactory—and that I regard the company's future prospects with confidence.

## ANGLO-IRANIAN OIL COMPANY

### FIRST FULL YEAR WITHOUT SUPPLIES FROM IRAN

The 44th annual general meeting of the Anglo-Iranian Oil Company, Ltd., will be held on June 11 in London.

The following is an extract from the statement to stockholders by the Chairman, Sir William Fraser, C.B.E., LL.D., circulated with the report and accounts:

The consolidated trading profit for 1952 was £45,354,732 after provision of £14,198,946 for depreciation on fixed assets, allied companies and other trade investments, and oil exploration interests. The gross trading profit thus totalled £59,553,678, comparing with £71,377,882 for 1951, from which depreciation and other write-offs totalling £23,682,949 were provided. 1952 was the first full year during which we had no oil production from Iran and the effect of this deprivation on our business, despite the greatly increased supplies which we obtained from other sources, is reflected in the reduction in our trading profits.

After providing £22,666,344 for taxation on profits, the amount available for reserves and dividends is £25,165,966, compared with £24,233,050 for 1951. Your Directors have allocated £1,000,000 to Preference stock reserve, bringing the total to £10,000,000, and have placed £16,000,000 to general reserve, which now stands at £97,000,000. They have recommended a final dividend on the Ordinary stock of 25 per cent, and in addition a cash bonus per £1 stock of 1s., both less income tax. The total distribution for the year would approximate 7 per cent on the Ordinary stock plus general reserve.

The Company's issue of £20,000,000 5 per cent Debenture Stock in January last was largely oversubscribed. The purpose of this issue was to supplement the Company's existing resources in financing the current programme of capital expenditure, mainly on construction and extension of refineries and building of tankers. This large programme on which expenditure during 1952 was approximately £57,400,000 and during 1953 is estimated at £75,000,000, is designed to maintain the Company's position in the forefront of the highly competitive and progressive world petroleum industry.

Events regarding the Company's interests in Iran since my last statement have been extensively reported in the Press. There have now been no less than five separate major attempts to settle the dispute. Three missions have visited Tehran and have tried to reach a settlement through direct negotiations. On each occasion the proposals were rejected by the Iranian Government. Despite this, efforts have continued through Governmental channels, and these led to the submission of further proposals to the Iranian Prime Minister in August, 1952, and again this year. The proposals communicated on August 30 last were joint Anglo-American proposals.

In its reply on September 24 the Iranian Government put forward counter-proposals regarding the basis on which the issue of compensation should be referred to the International Court. The counter-proposals included the demand that the claims of the Company for compensation should be restricted to the property which belonged to the Company in Iran at the time of the passing of the Nationalization Laws, and that the Company should have no right to make any further claims whatsoever. This would have expressly excluded all possibility of a claim by the Company for the loss of the 1933 Agreement which was terminated unilaterally by the Iranian Government. The fact is that the Company has been deprived of the benefit of extracting and disposing of Iranian oil for the remaining period of the Agreement, and an award of compensation based on the loss of the Company's installations alone would quite fail to recognize this fact.

Her Majesty's Government rejected the counter-proposals on October 14, reiterating that the International Court should be asked to consider all claims and counter-claims of both parties without limitation.

Proposals were again submitted early this year, through the good offices of the United States Ambassador in Tehran. The negotiations were entered into on the understanding that Dr. Musaddiq would be willing to have the question of compensation settled by the International Court of Justice on the basis of any United Kingdom Nationalization Law which the Company might select. Had there been formal agreement on this point and on the methods for the actual payment of the award of the Court, the United States Government was prepared to make monetary advances to the Iranian Government to be repaid in oil. The award could have been discharged largely, and perhaps entirely, in the form of oil from the enormous reserves discovered by the Company in Iran, and by means of the highly developed production facilities it had installed there. In the Anglo-United States communiqué of March 7, 1953, the United States Government described these proposals as "reasonable and fair," but once again no agreement was reached with the Iranian Government.

Broadcasting on March 20 a rejection of the proposals, Dr.

Musaddiq set out what were reported to be his Government's proposals regarding a settlement. In the same broadcast Dr. Musaddiq not only refused again to allow the loss of the Company's 1933 Agreement to be taken into account in the framing of terms of reference for the International Court of Justice, but he went further and asserted, not for the first time, that the Agreement itself was invalid.

### OBSERVANCE OF CONTRACTS A FUNDAMENTAL FACTOR

The proper observance of contracts is a fundamental factor in international trade, and Her Majesty's Government and the Company have stood on the principle, well established in international law, that compensation for losses resulting from expropriation must be prompt, adequate, and effective. While the Company would be ready to accept payment by instalments the International Court of Justice must, if the principle regarding compensation is to be preserved, be free to give unfettered consideration to the Company's claims in respect of the loss of the 1933 Agreement. That Agreement remained the unchallenged legal basis for the Company's operations in Iran for eighteen years, the Company, on the strength of it, being encouraged to make an investment in a foreign country of unprecedented magnitude. The facts speak for themselves and entirely contradict Dr. Musaddiq's contention that the 1933 Agreement was never valid.

The Company is at present dispossessed of its property, rights and interests in Iran, thereby suffering grievous losses. The Iranian Government has neither paid compensation nor agreed a satisfactory basis and procedure for the future assessment and payment of compensation, and the practical effect of the Iranian Nationalization Laws of 1951 has thus amounted to confiscation.

The Company, therefore, continues to claim the title to all oil derived from the area of its operations in Iran, and has accordingly published announcements in many countries stating that it will take all such action as may be necessary to protect its rights should any concerns or individuals participate in transactions affecting such oil. Legal proceedings have already been taken in Aden, Italy and Japan.

### PRODUCTION, REFINING AND SALES

Crude-oil production in Kuwait, Iraq and Qatar was largely increased during 1952, when our offtake from those sources of supply totalled some 25,600,000 tons, compared with 16,600,000 in 1951. During 1953 we expect to have available some 35,000,000 tons from Kuwait, Iraq and Qatar.

The Company's post-war programme for increasing its refinery capacity in the United Kingdom is being brought to fruition. The result will be to have expanded this capacity over ten-fold, from under 1,000,000 tons per annum pre-war to 10,500,000 tons per annum by the end of this year, with a corresponding improvement in the diversity and quality of products. The statement also details the Company's expanding refinery operations in Belgium, France, Germany, Italy, Israel, Kuwait, Australia and Aden.

The difficulties which we have been facing due to the denial to us of supplies from Iran were accentuated in the earlier part of the year by a world scarcity of tanker tonnage available for prompt chartering. Nevertheless, the A.I.O.C. group's sales of crude oil and refined products in 1952 totalled just over 32,000,000 tons showed a decrease of only 3,000,000 tons, or 8.6 per cent, compared with 1951. Our sales of refined products in the markets supplied through our subsidiary and associated marketing companies were above those for 1951, though only by some 2½ per cent.

The commissioning of our Kent refinery early in 1953 has effected an important increase in our availability of products of our own manufacture. But the problems of supplying economically our market outlets east of Suez will remain considerable until we can bring into operation the refineries now being constructed at Aden and Kwinana in Western Australia. These are large undertakings; construction work is being pressed forward as rapidly as possible, but we cannot expect these new plants to be on stream before the end of 1954. When they are completed, we shall, in conjunction with the expansion of our other refineries, have a total refining capacity of some 30,000,000 tons per annum. Not only will this allow for an appreciable extension of our Group's sales of products, which in 1952 amounted to just under 23,000,000 tons, but also we shall have a chain of refineries well placed to supply our market throughout the eastern hemisphere.

The volume of our sales during the early months of 1953 has shown an encouraging expansion. On the other hand, market conditions are more difficult. Selling prices have been reduced as a result of lower freight levels and, in addition, the more ample availability of refined products has led to very competitive conditions. Consequently, profit margins to-day are smaller than was the case in 1952.

## RAND MINES, LIMITED

At the fifty-eighth annual general meeting of shareholders held in Johannesburg on May 15, **Mr. W. H. A. Lawrence**, the chairman, in the course of his remarks said:

Dividend receipts which are the chief source of revenue for your company decreased by £188,304 and, due to this and other variations in items of revenue and expenditure, the profit and loss account balance was lower by £130,612. Reductions of £107,550 in dividends declared for the year and of £54,875 in other appropriations and transfers were responsible for a further increase in the amount added to the unappropriated balance, which stood at £1,878,008 at the end of the year. The net liquid surplus, however, was reduced by £508,703 to £852,196, mainly through the acquisition of a further substantial holding in Harmony Gold Mining Company, Ltd., and investments in shares and debentures increased by £446,776 to £6,015,278.

The working profits of the industry, excluding additional revenue from sales of gold at enhanced prices, decreased from £44,220,743 in 1951 to £38,791,794 in 1952. The decrease in profits occurred in spite of the higher price for gold resulting from exchange rate fluctuations, the increase in yield and the improvement in the total tonnage milled, and is therefore due entirely to an increase in working costs, which rose by 2s. 4d. per ton milled. Further, the additional revenue from sales of gold at enhanced prices decreased by £2,993,877, and thus the total working profit for 1952 was £8,422,826 lower than for the preceding year.

Another problem of far-reaching importance to the gold-mining industry is the shortage of labour, which is seriously restricting the tonnage output at the individual mines and therefore tending to reduce revenue and to raise unit working costs. At the same time, steps have been taken to economize in the use of labour by increasing mechanization wherever economically possible, and by better training and use of employees in order to increase productivity. The success of the latter measures may be judged by a comparison of the results for 1946 and 1952. In 1946, with an average underground non-European labour force of 223,947, 56,927,500 tons of ore were milled, equal to 254 tons per boy, whereas in 1952 the average underground labour force was 199,193 and the tonnage milled 60,069,500, equal to 302 tons per boy. In spite of these efforts, however, the labour supply, particularly non-European, is falling increasingly short of requirements, and in an attempt to meet the position it has been decided to introduce further improvements in conditions of employment for non-Europeans, the most important of which is an increase of 4d. a shift in the minimum rates of pay applicable to underground workers.

As a result of negotiations with the Mining Unions Joint Committee it has recently been agreed to increase the increment of 1d. an hour after ten years' service applicable to all European employees other than officials to 2d. an hour and to grant further increments of 1d. an hour after 15 and 20 years' service.

On the brighter side of the industry balance-sheet are the encouraging results at various developing mines in the three areas mentioned above, and the preparation for and commencement of uranium production at some mines. Your company holds shares of several Free State mines but its principal interest in the area is centred in the Harmony Gold Mining Company. As a result of the many boreholes drilled on and around the Harmony property it is considered the mining conditions will be good and that very nearly the whole of the property is underlain by Basal reef. The results disclosed in the shaft intersection and in the limited amount of reef development so far undertaken have tended to strengthen this optimism regarding the prospects of the mine and the return on your company's large investment in the Harmony company.

The power supply position deteriorated further during 1952 but the erection of new power stations and increases in generating capacity should enable the Electricity Supply Commission to meet the requirements of new mines and the uranium plants without imposing further power cuts. By the end of the year there should actually be an improvement in the position.

In general then it will be realized that although the gold mining industry is faced with some very serious, if not unprecedented, problems there are also certain grounds for modest encouragement.

Your company also holds shares in companies whose various interests centre on coal mining, timber growing and exploitation and on the manufacture of cement, lime and concrete and steel pipes.

During 1952 there was a slowing down of the overall rate of increase in economic activity in South Africa. This is not an unhealthy sign, and under the present conditions of financial stringency and labour shortage it is, in fact, considered that the safe course for the Union would be to place emphasis on consolidation of the rapid progress made in recent years rather than on new development.

The report and accounts were adopted.

## CROWN MINES, LIMITED

At the fifty-seventh Annual General Meeting of shareholders held in Johannesburg on May 13, **Mr. W. H. A. Lawrence**, the Chairman, in the course of his remarks said:

Last year in my annual address I drew the attention of shareholders to the sharp deterioration which had taken place during 1951 in the position at the mine and to the resultant shortening of the profitable life remaining to it. I mentioned the steady and persistent decline in values and percentage of payability on the Main Reef Leader which had taken place in previous years with increasing depth and explained that the general position and prospects at the mine had deteriorated rapidly during 1951 as a result of the large increase in working costs, the continued decline in yield, the substantial decrease in values exposed on the Main Reef Leader and the disclosure of the serious proportions and extent of the reef dislocation at the bottom of the mine. I shall therefore confine my address to-day to comments on the more important developments that occurred during 1952 and their probable effects on the future of the mine.

You will have seen in the reports to which I have already referred that it was decided to cease work south of the large Vierfontein dyke. The results of exploratory operations were disappointing and it was considered that there could be no economic justification for incurring the heavy capital expenditure that would be necessary to open up the deep level area. Sinking was therefore stopped at the incline shafts which would normally have been advanced south of the dyke now proved to extend over two-thirds of the mine from the eastern boundary. The present and prospective reserves of ore north of the dyke are comparatively limited and development was accordingly started in shaft pillar areas in order to prepare them for extraction in the near future.

This alteration to the previous balance of operations coincided with a steady decrease in the labour force, but it was nevertheless possible to transfer personnel released by the curtailment of off reef development to operations making a more direct contribution to the development and extraction of ore. In consequence of these transfers it was possible steadily to increase the footage developed on reef. On the Main Reef Leader, which is the only reef on the company's property of major economic importance, development in the eastern section was concentrated in the more promising areas including shaft pillars and as a result both grade disclosures and payability were better than in the preceding year. In the central section, although the development was selective, values continued to be generally low. Present indications are that few areas remain to be opened up in these two sections of the mine, where development operations are likely to be completed within the next year or two. In the western section, where the dyke has not yet been encountered, normal development operations were continued and although the overall values disclosed were better than the previous year's figures, there was nevertheless a continuation of the declining trend in values with increases in depth.

You will have noted from the quarterly reports that there was a steady improvement in the operational results. These furnish convincing evidence that the rapid deterioration of the mine's position in 1951 has been arrested, albeit only temporarily. Provided costs can be held at about their present level and provided there is no undue decrease in the labour force, the extraction of shaft pillars on the eastern side of the mine is unlikely to commence until about mid-1954, that is one year later than anticipated last year. However, as a precautionary measure and as a form of insurance against possible labour inadequacies, the preliminary work in the shaft pillars is being continued in order that the ore may be in an advanced stage of preparedness for immediate exploitation. It is considered that the position can be maintained until all the payable ore in the lower levels of the eastern half of the mine has been removed. At that stage the ore remaining in the upper levels of the eastern half of the mine in shaft pillars and certain scattered blocks will be mined in conjunction with ore from the western half of the mine. These operations may enable the grade to be maintained but the tonnage milled must be expected to decrease substantially due to the contraction in the available ore reserves.

The results for the first four months of the current year are as follows:

Tons milled ...	...	...	1,039,000
Yield per ton milled—dwt.	...	...	3.229
Working revenue	...	...	£2,078,334
Working revenue per ton milled	...	...	40s. 0d.
Working costs	...	...	£1,927,104
Working costs per ton milled	...	...	37s. 1d.
Working profit	...	...	£151,230
Working profit per ton milled	...	...	2s. 11d.
Additional revenue from sales of gold at enhanced prices	...	...	£47,696
Development footage	...	...	21,838

The report and accounts were adopted.

## EAST RAND PROPRIETARY MINES, LIMITED

At the fifty-seventh Annual General Meeting of shareholders held in Johannesburg on May 13, **Mr. G. V. R. Richdale**, the Chairman, in the course of his remarks, said:

Working costs rose sharply during the year by 5s. 1d. to 40s. per ton milled, partly as a result of the lower tonnage milled and partly owing to the higher prices of stores and the increased cost of living allowances paid to employees. Despite the average decrease of 5s. 10d. an ounce in the premium received from sales of gold for non-monetary purposes, revenue for the year was higher by 1s. 9d. at 55s. 3d. per ton milled owing to an improvement in the yield. As a result of these fluctuations the net profit earned by your company at £1,880,327 was £567,917 lower than in 1951. On the other hand, the amount provided in respect of taxation for the year under review was £374,186 less than the corresponding figure for the previous year and, after providing for dividends totalling 5s. a share, left a balance unappropriated at December 31, 1952, of £1,018,089 compared with £849,666 at the end of 1951.

In common with all producing gold mines, your company is suffering from the serious shortage of non-European labour, which has a particularly severe effect in the case of this mine, where there is a high native labour efficiency factor. The persistence of this downward trend in the supply of native labour has made it impracticable to carry out the full development programme over the whole strike of the mine and development in the Western Section was, therefore, curtailed during the year as the prospects in the Central and Eastern Sections appear to be better. The labour shortage was also chiefly responsible for a decrease of 173,000 tons in the tonnage milled last year, which adversely affected working costs per ton milled and consequently the pay limit of the ore reserve. Mainly as a result of this the available reserve was reduced at December 31 by 892,000 tons to 6,051,000 tons, although the payable ore developed during the year was greater than the comparative tonnage for 1951. In previous addresses I have frequently referred to the system of mining which is being carried out in the deep level areas of the mine. The time may come when your Board will find it desirable to make reference not only to the available ore reserves which have been fully developed on traditional lines, but also to the potential or prospective reserves which may be in sight.

The Central Sub-vertical and South-East Vertical shafts were sunk to their final depths during the year, when the former reached the great depth of 9,637 feet below the surface. The South-East Vertical shaft is now being equipped and work is well advanced in connection with the sinking of the South-East Sub-vertical shaft and five sub-incline shafts, these latter being below the 8,000 feet horizon. Permanent hoisting equipment has been put into commission in three of the sub-incline shafts and the hoists for the remaining shafts are now at the mine. A pilot winze is being sunk in the reef above each of the sub-incline shafts, and during the year 3,662 feet of reef development was accomplished in these winzes, the values and percentage payability disclosed being very satisfactory. At April 30, 1953, a total of 9,337 feet of reef had been exposed in this way below the 58th level, over a strike distance of 19,200 feet. Of a total of 8,370 feet sampled from the commencement of winzing, 6,750 feet, or 81 per cent is payable, averaging 15.6 dwt. over 37 inches, equal to 576 inch-dwt.

It was expected that capital expenditure incurred during 1952 would be of the order of £925,000. Owing, however, to the shortage of labour and to the delay in the delivery of equipment, the net amount actually spent was £834,637. Capital funds on hand, which amounted to £608,286 at December 31, 1951, were exhausted during the year, the balance of expenditure of £226,351 being appropriated from profits. Capital expenditure during the current year is estimated to be of the order of £490,000 and will be financed from profits. I may add that consideration is at present being given to the desirability of sinking a new ventilation shaft from the surface to serve the deep level area in the far eastern portion of the mine, where recent development seems to indicate that good values can be expected. Should it be decided to undertake this work it will, of course, add considerably to the cost of the capital programme during the next few years.

I must emphasize that the position at the mine has been made considerably more difficult during the year owing to the shortage of non-European labour. This development is causing your Board and its technical advisers anxiety and must, if it continues, have a further restrictive effect on the tonnage milled and therefore on profits. It follows that if this occurs there will be less funds available for distribution to shareholders during the next few years, in which period the remainder of the heavy capital expenditure programme must be financed out of profits. It unfortunately seems likely, therefore, that there may be some reduction in future dividend declarations below the level which has been maintained in recent years.

The report and accounts were adopted.

## CITY DEEP, LIMITED

At the Fifty-Second Annual General Meeting of shareholders, held in Johannesburg on May 13, **Mr. G. V. R. Richdale**, the Chairman, in the course of his remarks said:

The net profit in 1952, at £466,540, was lower by £623,498 than in the previous year. This unexpectedly sharp decline in the profit earning capacity of the mine was due to a rise of 5s. 4d. per ton milled in working costs, together with a fall of 9d. per ton milled in revenue. The increase in working expenditure was mainly attributable to the decrease in tonnage, to the payment of higher cost of living allowances to employees and to a further rise in the cost of stores; the fall in revenue, which occurred despite a slight increase in the yield per-ton milled, was due to a decrease of 19,075 oz. in the output of gold, brought about by a drop of 104,000 tons in the quantity of ore milled compared with 1951. Furthermore, the premium on gold sold for non-monetary purposes realized only £119,121, which was a little less than half the amount received in the previous year. The decrease in the tonnage was mainly due to the serious shortage in the supply of non-European labour, which persisted throughout the greater part of the year and which still continues. This is a vitally important matter which constantly receives the closest attention of all concerned and which has been the subject of particular consideration by the Gold Producers' Committee in recent months. As a result, certain steps have been taken with the object of improving the supply of native labour to the mines, but it is as yet too early to judge how successful these measures will be.

During 1952 the programme of sinking the K line of sub-incline shafts from the 8,500 ft. horizon was continued with the object of opening up the deep level areas on which the future life of the mine depends. Towards the end of the year it was decided to abandon the top-cut resue method of stoping. This system, first introduced in 1928, aimed at reducing the number and severity of pressure bursts. In top-cut resue stoping a cut of waste is first taken above the reef, and the latter is then blasted and trammed. The method results in a higher grade than with normal stoping, but also in higher costs per ton milled. Some shareholders have at times been critical of resue stoping because of the high working costs per ton milled which result therefrom, but I would emphasize that this system has been in operation over a large area of the City Deep for the last 24 years and that until very recently it has proved satisfactory and well suited to the peculiar conditions of the mine. Towards the end of last year, however, it was decided, because of the increasingly difficult conditions arising from rock pressure and inadequate ventilation, to change to a longwall system of mining which enables air flow to be concentrated and which has proved successful in other deep level mines in lessening the troubles caused by rock pressure. It is hoped that this system will result in improved working conditions and thus have a beneficial effect on working costs.

Capital expenditure was expected to absorb £360,000 last year, but owing mainly to the shortage of labour the actual sum spent was only £271,926. During the current year capital expenditure is likely to be of the order of £200,000 or £250,000, mainly on winding and pumping equipment and the installation of an electric haulage system underground. I must, however, warn you that adequate ventilation of the deep level areas of the mine is likely to prove difficult and costly and it must be expected that heavy additional expenditure will be incurred in this connection during the next few years. As I informed shareholders last year, the capital expenditure programme will be financed from profits, but it is clear that so long as the margin between the price received for gold and the cost of producing it from areas 8,000 ft. or more below the surface remains as small as it is to-day, the profits which the mine is capable of earning must be severely restricted. While every effort is being made by the mine management and all concerned to reduce working costs to the lowest possible figure and at the same time maintain the grade of ore sent to the mill at the highest level compatible with the ore reserve position, your Board can see no prospect in the near future of maintaining dividends at their present level.

The difficulties through which your mine is passing are, as I have explained, directly related to the problems of pressure and ventilation at depth and to the serious shortage of native labour. These are all difficulties which have been forced on the mine management through circumstances beyond its control, but every effort is being made to tackle them energetically and on sound technical lines. On a long term view the future is not entirely discouraging and there is reason to hope that it will be possible to continue profitable operations for a relatively long period. I must emphasize, however, that the best that can be hoped for in the near future, unless there should be a favourable revision of the gold price, is that it will be possible to maintain annual dividend distributions on a very modest level.

The report and accounts were adopted.

## DURBAN ROODEPOORT DEEP, LIMITED

At the Fifty-Sixth Annual General Meeting of shareholders, held in Johannesburg on May 12, **Mr. W. M. Frames**, the chairman, in the course of his remarks said:

The Directors' Report and the audited Accounts, together with the reports of the Consulting Engineer and the Manager, which have been in your hands for some time, contain the usual full particulars of the operations at the mine and of the financial results obtained during the year under review. As results of operations during the current year have been published monthly and in the Directors' Report for the first quarter, I propose to devote my remarks to-day to drawing your attention to items of particular interest and to making some observations on the general position at the mine.

Despite the fact that operations were hampered by shortages of power and labour, there was a small increase of 18,000 in the tonnage milled. The average yield per ton milled was slightly lower than in the previous year but as a consequence of the higher tonnage milled gold recovery improved by 2,315 oz. Due to a sharp fall of £111,316 in the additional revenue from the sale of gold at enhanced prices, working revenue decreased by £71,238. Mainly as a result of higher prices for stores and materials and increases in cost of living allowances, working costs advanced by £227,345 on the figure for 1951. In consequence the working profit at £1,130,101 was £298,583 less than in the previous year.

In common with the rest of the industry the mine experienced a shortage of non-European labour and operated below capacity. In no month during the year did the labour strength reach the level of the corresponding month in the previous year, and particularly during the latter half of the year the number of non-Europeans in service was considerably below requirements.

The shortage of electric power persisted during the year but it was possible, by staggering operations and thereby decreasing requirements during peak hours, to minimize the severity of the power cuts imposed.

Approximating closely to the figure of £365,000 forecast in my address last year, capital expenditure during 1952 amounted to £364,406 and was incurred mainly on European housing, the sinking and equipping of No. 6A sub-vertical shaft, portion of the cost of the electric hoist for No. 6 shaft, extensions to the Roodepoort United section of the reduction plant and capital equipment comprised in stores and materials. At a mine such as ours, which is not only steadily increasing in depth of its workings but is opening up a new reef horizon, there is bound to be a relatively heavy and constant demand for capital expenditure on items such as sub-vertical and incline shaft sinking and equipment, ventilation, pumping and surface haulages. The expenditure will be spread over many years and is expected to be near the £300,000 mark for each of the next two years but to average less for the succeeding five or six years. In present circumstances your directors consider it to be in the best interests of shareholders to continue the practice of recent years of meeting all capital expenditure out of profits in preference to raising fresh capital or arranging loan facilities.

Development operations again exposed very little payable Main Reef Leader ore and opened up only a small tonnage of payable ore on South Reef. The greater proportion of reef development was on Main Reef in the lower levels where values were satisfactory and the percentage of payability was higher. Good progress was made with the opening up of the Kimberley Reef, development on which was confined mainly to the area between Nos. 5 and 6 shafts. A certain amount of development was also carried out westwards from No. 9 west winze just south of No. 6 shaft where the payability disclosed to date has been most encouraging. Sinking of the No. 26 west winze, 2,250 ft. west of No. 9 winze, was continued and satisfactory values were disclosed in the limited amount of reef development accomplished. It is too early yet to suggest the depth to which payable values will persist. The value of the ore to be mined from the Kimberley Reef is on average below that of the other reefs being mined and as a steadily increasing proportion of ore is likely to be drawn from this source a slight decline in yield is to be expected. On the other hand, the ore is being mined at very shallow depths and the cost of working it is considerably below the average for the remainder of the mine.

Since the close of the year application has been made to the Mining Leases Board for the undermining rights of approximately 750 claims adjoining the western portion of the company's southern boundary. This action has been taken because of the progress of current mining operations and in view of the fact that long-term planning for the exploitation of the reefs at depth would be considerably influenced by the acquisition of rights over this area.

The report and accounts were adopted.

## ROSE DEEP, LIMITED

At the fifty-seventh Annual General Meeting of shareholders, held in Johannesburg on May 12, **Mr. T. Reekie**, the Chairman, in the course of his speech said:

The annual report for 1952, which was issued about six weeks ago, contains the usual full details and comments concerning operations and the various factors affecting them. Information regarding operations during 1953 has been published monthly and in the Directors' Report for the first quarter. I would, however, like to add a few brief comments before formally asking you to adopt the report and accounts for 1952.

### THE PROBLEMS OF AN AGEING MINE

The technical problems of mining remain those associated with the profitable exploitation in the fifty-sixth year of operations of a multi-reefed, low grade property of limited extent—the primary development of which has been completed—and these problems are being seriously affected by adverse economic factors such as the rising cost structure, coupled with shortages of labour and power. These shortages are restricting and reducing the scale of mining and milling operations to well below the capacity of the mine and the reduction plant with serious consequence to the economy of the mine. For instance, the average monthly rate of milling during the twelve months ended March 31, 1953, has declined over each of the four quarterly periods from 85,000 to 82,000 to 78,000 to 72,000 tons. While this steady decline can be attributed mainly to the seasonal decline in the native labour force and to the drain on the supply to the older producing mines due to the increasing demands of new producers and developers, the persistent increase in costs and the resultant rise in the pay limit are making it more and more difficult to keep the mill supplied with sufficient payable ore. Shareholders are well aware that over the past few years every effort has been made to increase efficiencies by reorganizing and modifying the existing layout of the surface and underground workings. Some indication of what has been achieved can be gained from the fact that whereas in 1946 853,000 tons were milled and 13,711 ft. of development accomplished with an average native labour force of 4,666, in 1952 983,000 tons were milled and 45,081 ft. of development were done with an average labour force of 4,098. In other words, while the labour force was 12 per cent lower last year than it was six years previously, the tonnage milled was higher by 15 per cent and the development footage by 229 per cent. These figures reflect great credit on the management of the mine. It seems unlikely that any further material improvement can now be attained in this direction and, therefore, should the labour position deteriorate much further it will probably be necessary to reorganize the mine to operate on a reduced scale.

### FIRST CAPITAL REPAYMENT

In all the circumstances it is considered that the time is now opportune to commence making repayments of capital to shareholders and proposals in this regard will be submitted to the meeting under the heading of special business. It is intended to make a first repayment of 1s. per share to shareholders registered on June 30, 1953. This will absorb £35,000 and reduce the par value of the company's shares to 19s. each. Such repayments are tax free in the hands of all shareholders whereas dividends are subject to taxation in the hands of some shareholders.

The report and accounts were adopted.

A special resolution, reducing the company's capital from £700,000 to £665,000 by repaying 1s. per share to shareholders, was passed unanimously.

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## TRANSVAAL CONSOLIDATED LAND AND EXPLORATION CO. LTD.

At the fifty-eighth Annual General Meeting of shareholders, held in Johannesburg on May 13, Mr. T. Reekie, the Chairman, in the course of his remarks, said :

At December 31, 1952, net cash and cash assets, after allowing for all current liabilities, totalled £293,573.

It is satisfactory that the company's cash resources have been maintained after bearing its proportion of the expenditure on platinum prospecting and allowing for an increase in the company's share investments, which show an increase of £24,448 on the corresponding figure for the previous year, and were taken into account at a book value of £393,905. All investments for which share market quotations were available appear in the books at or under cost but in no case above market price at December 31, 1952. The market value of investments at that date greatly exceeded the book value shown in the Balance Sheet.

Capital expenditure at Van Dyks Drift Colliery amounted to £17,475 during the year. This was incurred mainly on the erection of housing, principally for non-European employees, the purchase and installation of underground equipment, prospecting, and the sinking of further boreholes to the south of the Olifants River to obtain additional information regarding the quality and extent of coal reserves in this area. This amount added to the figure of £819,775 in the Balance Sheet at the end of the previous year gives a total of £837,250, which represents the book value of the colliery at December 31, 1952. Further capital expenditure amounting to £13,684 was incurred, at the request of the Transvaal Coal Owners' Association, on the installation of additional screens, crushed coal bins, etc., to assist in increasing the colliery production of fine coal for power station requirements. All expenditure in this connection is for the account of the Association and will be refunded to the company by instalments.

As in recent years, operations at the colliery were again hampered by the inability of the Railway Administration to provide the necessary rolling stock to enable the colliery to operate to its capacity. A considerable number of hours were lost due to this factor, with the result that the coal despatched during the year was 3,643 tons lower than in the previous year. Nevertheless profits, which were adversely affected last year because of restricted output and the embargo on the export of coal, were 25.5 per cent higher due to the increased maximum prices authorized by the Price Controller, with effect from June 27, 1952, for coal sold on the inland market by Transvaal and Orange Free State producers.

Your colliery continued to produce coal of high grade but production during the latter months of the year was limited to five out of six available mining districts. This arrangement was adopted in view of the limitations of railway transport and in order to utilize the available native labour force to the best advantage. All districts are, however, capable of producing full outputs whenever required, and current production could be considerably expanded should the railways become capable of handling larger tonnages for the internal and export markets. The installation of additional screens, conveyor belts, bins, etc., at the request of the Transvaal Coal Owners' Association, which I mentioned earlier, was completed during the year and these modifications resulted in a substantial increase in the colliery's production of small coal.

The company continues to hold a 45 per cent interest in the Platinum Prospecting Association No. 3 which proceeded with the underground exploration of the farm Boschkoppie No. 685 in the Rustenburg district of the Transvaal. Development from the two incline shafts on the property progressed during the year and a satisfactory footage was accomplished and sampled on reef. The programme of underground exploratory work is being continued for a further period as sufficient information has not yet been obtained on which to base a decision regarding the future of the property.

The royalties received in respect of properties let on tribute showed the substantial improvement of £16,093. This was principally due to an increase of £12,155 received from the chrome property on the farms Doornbosch No. 423 and Winterveld No. 424 in the Lydenburg district of the Transvaal. This increased amount was largely in respect of the royalty paid on a large tonnage of ore previously dumped on the property which has been removed by the Tributary to Steelpoort on the main railway line to Lourenco Marques. There was also an increase, amounting to £6,046, in the royalty receipts in respect of the Penge amosite asbestos property in the Lydenburg district. A modifying agreement is at present being negotiated with the tributary, Egnew (Pty.) Limited, a subsidiary of Cape Asbestos Limited, whereby our company will obtain increased royalties and the tributary will be granted greater security of tenure.

The report and accounts were adopted.

## LYNDHURST DEEP-LEVEL (GOLD AND SILVER)

The annual general meeting of Lyndhurst Deep-Level (Gold and Silver), Ltd., was held on May 20 at The Chartered Insurance Institute, 20 Aldermanbury, London, E.C., Mr. Robert Annan, M.I.M.M., the chairman, presiding.

The chairman in the course of his speech said :

During the past year we have continued the policy which I announced at our last meeting of mining ore from our developed reserves for treatment in the Konongo mill and, while the amount so treated was 4,000 tons less than in the previous year, an improvement in grade and in recovery and the sale of the entire output in the free market for the last nine months resulted in a revenue only £1,100 less than in the previous year. Working expenditure was higher by reason of increased wages, but, with a reduction in the appropriation for development redemption and an increase in sundry revenue, the gross profit at £72,331 shows an increase of £4,155.

After bringing in the unappropriated profits from the previous year and providing for depreciation, etc., there is a balance available of £87,488 compared with £65,839 in the previous year. Out of this your directors recommend the payment of a dividend of 25 per cent less tax at 9s. as against 15 per cent paid in the previous year. This will absorb £60,500 net and leave £26,988 to be carried forward.

During the past year 15,145 tons of ore were treated in the Konongo mill resulting in a decrease of 13,690 tons in the ore-reserves, which at the year end stood at 39,460 tons averaging 16.0 dwt., of which 8,900 tons averaging 10.3 dwt. are contained in pillars. From this rate of depletion it is evident how little new ore was developed during the year.

Development over the period was again without significant result. As I reported at our last meeting an exhaustive examination of the surface of our concessions has been completed without any new discoveries being made. A small amount of underground work remains to be done and is being carried out as rapidly as conditions permit.

On the Boabedroo Concession, the 4th Level has been advanced to the north-east to explore the area under a surface showing 2,500 ft. from the Boabedroo shaft. As it is now close to the vertical downward projection of this showing, diamond drill holes have been put out on either side disclosing a zone of fissuring on the footwall side. Within this zone were two occurrences of quartz, one assaying 3 dwt. over 30 in. and the other 0.2 dwt. over 28 in. A crosscut is now being driven to cover the entire zone of fissuring after which driving will be resumed on the most favourable showing. On the 6th Level Boabedroo a crosscut towards the Awere Vein now lacks about 70 ft. of the projected position of the vein at this level.

A surface showing known as Gibson's Reef on the Odumase Concession will be prospected by an extension of Konongo's 9th Level Odumase which is now approaching the joint boundary.

Samples from the manganese-bearing area referred to in our last report have been subjected to extensive tests, which have demonstrated that this material is not amenable to concentration and the occurrence is, in consequence, of no commercial value.

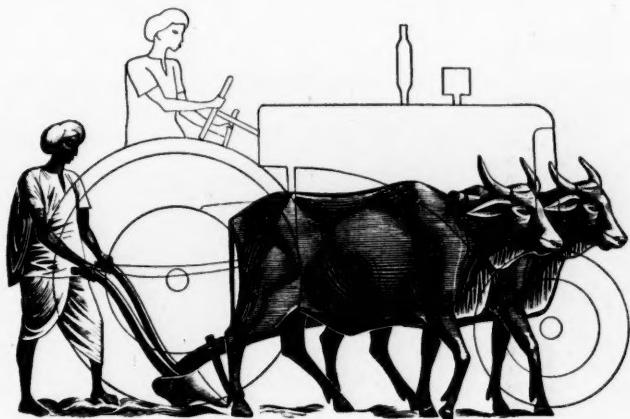
Our holding in Konongo Gold Mines, Ltd., remains unchanged and represents 43.7 per cent of the capital of that company, which has recently paid a dividend of 10 per cent, less tax, the same as for the past eight years.

From what I have said you will realize that, unless we are fortunate in making some new discovery, our future will depend largely on the future of Konongo. We are continuing with development on the lines I have just indicated and will also continue to mine ore from our remaining reserves for treatment in the Konongo mill.

Members must realize, however, that in the past year we extracted more than a quarter of the ore-reserve existing at the beginning of the period and that the remainder will suffice for little more than two years' production at the existing rate. It is therefore a rapidly wasting asset. The dividend which we are now recommending must be viewed in the light of these facts. Out of a gross profit of over £72,000, no less than £42,000 was obtained from the treatment of ore most of which was not replaced by development and this sum suffered no tax owing to allowances and past losses brought forward. Neither of these conditions can persist much longer and if you approve of the proposed distribution you must regard it as exceptional. We are, however, able to meet the cost of current development out of revenue and will still retain a satisfactory cash position.

In these circumstances we feel that our recommendation is justified and that no object would be served in retaining funds beyond our requirements. At the same time it is necessary that the general position should be made clear and that you should be given a frank indication of the future trends as we see them at present.

The report and accounts were adopted.



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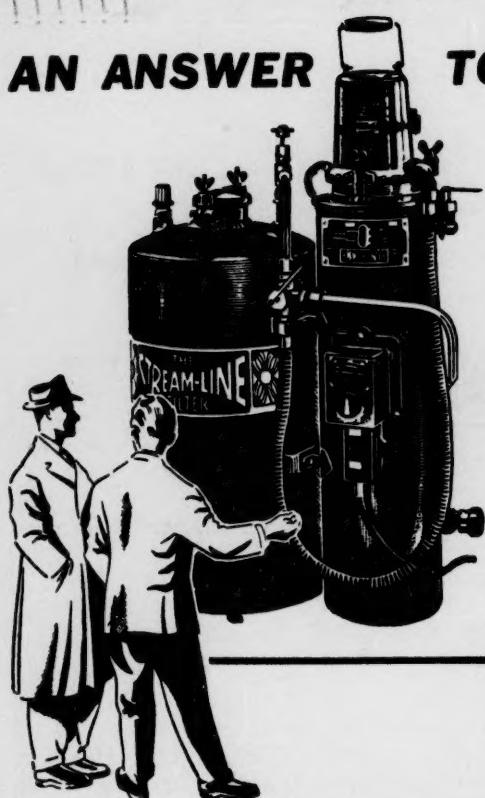
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